BUTANE-PROPANE News

25¢

That never happened in my Range..."

YOUR oven pilot blew out? Why, that *can't* happen here! You see, my Grand Range has a wonderful Safety Oven Pilot that's actually draft-proof. The flame can't be blown out by vagrant breezes or by opening or closing oven doors. So there's no chance of gas escaping... no risk, or waste of precious fuel." The Safety Oven Pilot is just one of dozens of ways in which Grand Ranges are proving their mettle in extra wartime economy and for-the-duration service. Thanks to their built-in quality, Grand Ranges are doing tireless service on the home front today ... and thousands of delighted users will turn to new Grands again in the post-war world of tomorrow.

WHEN PEACE COMES
...IT WILL BE GRAND

Grand GAS AND ELECTRIC *Ranges*

DIVISION OF THE CLEVELAND COOPERATIVE STOVE COMPANY
CLEVELAND, OHIO

MAY 1943

He gets his second breath from a deep-drawn cylinder

The oxygen cylinder shown below is another example of the way the Hackney deep-drawing process is conserving materials, man-hours and equipment—and is producing improved products.

High above the clouds, deep-drawn cylinders containing oxygen aid pilots to breathe easily. To meet necessarily stringent requirements, cylinders must be light in weight and have high tensile strength.

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And products like the one described above keep rolling out of Pressed Steel Tank Company's factory. Today, all of Hackney's facilities are pledged to the making of products for Victory. However, we continue to learn new things every day—uncover new knowledge—and all this experience and research will be put to work for you . . .

When Victory Comes

Then we'll be able to turn our energies toward the making of instruments of peace. Hackney will again be the source for L-P Gas Cylinders which are durable in service—light in weight—long lasting—low in maintenance cost . . . preferred throughout the industry.

Pressed Steel Tank Company

GENERAL OFFICES AND FACTORY · 1487 SOUTH 66th STREET

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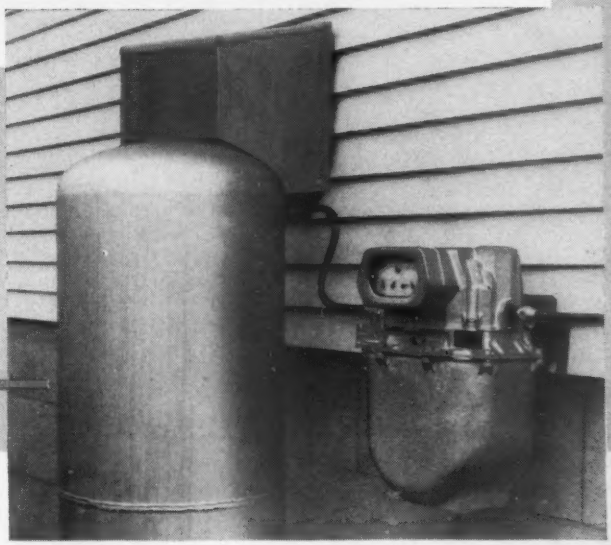
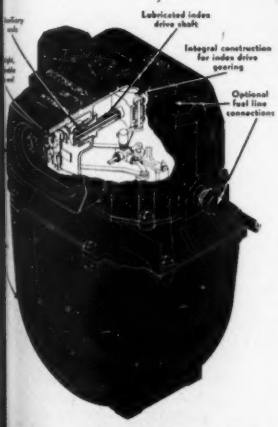
Through EMCO *Special* BUTANE-PROPANE VAPOR METERS





Indexes reading in therms, decitherms, gallons, pounds or equivalent cubic feet are available.

FOR generations the Manufactured and Natural Gas Industry, as well as Water Works Industry, have measured the consumption of their products by meter. Their customers accept meter measurement as the fair and equitable method by which to buy these commodities. Your customers, too, would prefer to buy LPG through meter-measure. It's the equitable way because you and your customers are assured of accurate measurement. Shortage disputes are eliminated. It's the economical way because your drivers will save time, make quicker deliveries, hence cover more routes from each truck.

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Propane Meter

EMCO Large Capacity Pressed Steel Gas Meter

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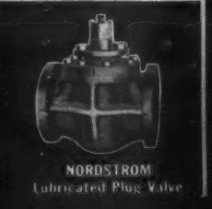
ROTOCYCLE Meter for Liquid Butane - Propane


NORDSTROM Lubricated Plug Valve

BUTANE-PROPANE News

Reg. U. S. Pat. Off.

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Daily more and more users of Butane-Propane are learning to depend on ANCHORGAS as a satisfactory high quality product.

Anchor enjoys the confidence and patronage of leading firms throughout America. Here's why:

1. Anchorgas is available for both industrial and domestic use.
2. Anchor is not in the retail business. We will never be your competitor.
3. Plants in Oklahoma, Kansas, Texas and Louisiana provide an excellent source of supply for delivery to you at the lowest rate of freight.
4. Anchor's engineering department is glad to assist customers in getting L. P. G. that will do a specific job best, or to recommend solutions for special problems.
5. Only the highest quality fuels are used in manufacturing Anchorgas.

ANCHOR PETROLEUM COMPANY

Tulsa, Oklahoma

LETTERS

Gentlemen:

I note in your March copy, on Page 4, the data with regard to the loss in gallonage in unloading cars, and to verify the figures that I have arrived at for my particular case, I would appreciate your solution of this problem.

I submit the following data:

Tank car, 12,000-gal. capacity; unloaded by suction pump; gas, butane; temperature, 46°; pressure, 36 lbs.

When liquid has all been removed, to how many gallons, at 46°, is the residual vapor equivalent to?

I would appreciate your solution to this problem very much.

H. H.

Florida

You ask for additional information regarding the loss in gallonage in unloading tank cars. Filling in the figures as shown on Page 5 of our March issue, you would use 31.6 cu. ft. per gal. as taken from the Handbook BUTANE-PROPANE Gases for normal butane. The amount of vapor remaining is equivalent to 160 gal. of liquid, at 60°. At the 46° you mention it would be a little more than 156 gal. If you desire to know what this liquid would be at any other temperature apply the volume correcton factor as shown in Chapter 3, beginning on page 50 of the Third Edition of the 'Handbook" which you have just recently received.—Ed.

•

Gentlemen:

I have been searching for some reliable data cn the life of underground butane tanks.

I feel that an "operating life" should be determined as nearly as possible to the actual life, less, say, two years as a safety factor. Then this 'operating life" could serve as a basis for depreciation of such tanks.

There seems to be a wide divergence in opinion on this subject. Any information you can supply will be appreciated.

V. M.

Alabama

Considerable inquiry shows no one willing to venture an opinion upon what should constitute the normal life of a buried tank. The difference in soil composition, the presence or absence of moisture in the ground, the quality and thickness of the protective coating which was originally applied and the element of chance which may have caused damage to that coating in installing the tank are all of such variable natures and so far beyond the application of any general rule that no one seems to believe it possible to forecast the life of a tank that has been installed underground.

Ultimately of course, an average length of serviceability will be established by actual practice but even that will probably not be of value to individual dealers because their own soil and operating conditions would be the governing factors in every case. Possibly readers can contribute information from their own experiences.—Ed.

•

Gentlemen:

Would appreciate very much receiving your opinion to the following question, namely, What precaution would you deem necessary in changing gas distribution system for a customer who has been using natural gas, to the use of straight liquefied petroleum gas?

To state the question another way, is it necessary, in your opinion, if the customer's distribution system is in steel pipe and after a test pressure of 20 times greater than the normal working pressure used as a test, would you also use pipe dope

throughout the system to preclude any contingencies that might arise?

In the instance in mind everything was gone over carefully with the exception of the pipe in between the walls and the entire system held, showing no leaks under 20 pounds of pressure, for a period of 30 minutes, which was indication enough to us that under normal 6-oz. pressure the system would naturally hold. Your opinion would be greatly appreciated.

E. C.

Missouri

The tests referred to in your letter is all that is usually done on a changeover, and should be considered adequate in our opinion.

A subsequent failure in the house piping is always possible, regardless of the type of gas used.

A changeover from manufactured gas to liquefied petroleum gas should be gone into more thoroughly as often the piping is tight, due to deposits left by the manufactured gas.—Ed.

•

Gentlemen:

In your January issue D. B. R. asks how to ascertain whether a gas is all propane or a mixture of butane and propane. Your answer will certainly determine whether or not it is a mixture if that is all he wants to know.

I have worked out a plan to determine the percentage of butane and propane in any mixture where only these two gases are present, which happens to be the case with us this year since isobutane is being taken out and used for aviation gasoline.

I secured a small pressure tank holding about a gallon and arranged connections so that this cylinder could be filled. Then I installed a pressure gage and thermometer well, filling the well with mercury. The following procedure and formula will give the exact percentage of each of two gases, but it will not work where more than two gases are involved.

Fill the cylinder about three-quarters full of liquid gas. Let stand until the mercury has reached the same temperature as the mixture. Insert thermometer and take reading of temperature which I shall call "T".

Read pressure gage for pressure of mixture and call this reading "PM".

On Page 9 of Handbook BUTANE-PROPANE GASES, Second Edition (Page 26, Third Edition), find the gage pressure of propane at that temperature. This I call "PP".

On Page 10 find the gage pressure of butane at same temperature which will be "BP".

Let X = percentage of propane

$100 - X$ = percentage of butane

$PPX + BP\ (100 - X) = PM$

For instance, if the temperature of the mixture is 40° and the gage pressure 10 lbs., the percentage of propane is .116.

With this gadget I take a sample of every shipment received to determine not only the percentage of propane and butane, but the B.t.u. content as well.

I am not an engineer and should be glad to have you check my formula for accuracy and practicability.

G. S. C.

Texas

The method you are using will give you a rough approximation of the proportions of propane and butane. What you are doing is obtaining the approximate vapor pressure of the mixture. No gasses delivered from the refineries are true mixtures. They may contain a small prcentage of ethane and possibly pentane and will be sure to contain a small amount of isobutane. A colorimeter test is the only presently accepted method of determining the true B.t.u. content.—Ed.

•

• **BUTANE-PROPANE *News* welcomes letters from our readers, but it must be understood that this magazine does not necessarily concur in opinions expressed.—Editor.**

W. W. BANKS
Guest Editor for May

It's Time to Start Thinking

By W. W. BANKS
President, Dallas Tank & Welding Co., Dallas, Texas

THERE are two great problems before American industry today: war production and post-war planning.

Much has been written about both. Much has been done about the former. So far it is the over-all picture of American industry after the war that has concerned writers and theorists in their suggestions for plans to come. But all branches of industry have different problems and only as they are separately able to perfect their own operating plans will the master over-all plan be workable and successful.

The liquefied petroleum gas industry is distinctly a branch of itself. While the welfare and success of many other industries are indirectly dependent upon it, the members of our branch must look only to themselves for formulating plans that will permit full steam ahead when the war ends.

To get the jump on our chief competitors, we must have a vision of our goal and a map to guide us to it by the shortest, surest route.

Everyone engaged in any department of propane and butane refining, marketing, manufacturing and servicing can contribute a worthy portion to our ultimate success. To accomplish this there must be much forward looking, first, by individuals, then by companies and groups, and finally by the industry as a whole . . . acting by common impulse, working with mutual trust and energy.

The time will come a little later for that collective action, but we will not then be able to act intelligently as a group unless now we start thinking constructively as individuals. Yes, this is a good time to start such constructive thinking if we want to be ready to act when the gates of after-war expansion open to us and to the superior products we have to dispense for the comfort, convenience, needs and profit of millions of individuals at home and in industry.

If we don't do this, when the whistles of peace blow we will be dangling from the limb of uncertainty, powerless to grasp the unrivaled opportunities that will then present themselves.

American Stove Company's post-war plans

TODAY the American Stove Company is using every bit of its capacity in war production. All of our engineers and skilled workers, every unit of our personnel are giving their last ounce of energy in the great struggle for Victory. Top salesmen are in factories, some sales managers are foremen in production departments. Day and night our men and women are working ceaselessly, doing back-breaking and heart-breaking jobs which a few short months ago seemed impossible.

PEACE PLANS BLUE-PRINTED

But in the midst of the noise and turmoil of battle, American Stove Company is not forgetting its Victory Day responsibility. Long before Pearl Harbor new plans were being laid; never since that day have they ceased or slackened.

ON MARCH 10th, Mr. S. E. Little, Vice President in Charge of Sales, took precious time out to call his Planning Committee together in Cleveland for a two-day discussion of this important subject. He found the members of this committee well prepared with answers to a host of problems. Concrete plans were laid out, blue-printed and reduced to writing.

NO MAN CAN TELL when this war will end. It is, therefore, apparent that no plans can be made with any specific date on the calendar as a starting point. We do know the starting point is the day after Victory Day. Our plans are being laid on that basis. The blue-prints cover a six months' period after the war's close, a six months' period after that and a twelve months' period after that. The things which will need to be done, and which can be done in the way of development, production and sales in each of these periods were carefully studied and laid.

NO FUMBLING ON VICTORY DAY

There will be no fumbling in American Stove Company on Victory Day. The engineers, plant managers, and sales managers will brush off the seats of their pants, take a long breath and sigh with relief as they say to themselves, "Well, that big job is over." Then they'll reach in the top drawer, pull out their plans and get busy on the big job ahead.

OUR PLANNERS are not foolish enough to think it will be that easy. A good General maps out a well laid plan of campaign but he knows it will never be followed to the letter. He knows that he must follow his army into the field and revise his plans daily, hourly, and momentarily as the contingencies of battle change. Our planners are doing the same. Periodically they get together and keep their plans up to the minute. Many changes may have to be made. But on Victory Day there will be no hesitation. At that time the plans will be complete up to that day. On that day our plans will go into immediate operation.

Magic Chef

THE RED WHEEL GAS RANGE WITH THE LIFETIME BURNER GUARANTEE

AMERICAN STOVE CO., 4301 PERKINS AVENUE, CLEVELAND, OHIO

NEW YORK . . . CLEVELAND . . . ATLANTA . . . LOS ANGELES . . . CHICAGO
SAN FRANCISCO . . . SEATTLE . . . PHILADELPHIA . . . ST. LOUIS

MAINLY BEYOND THE MAINS

By ELLIOTT TAYLOR, Washington Editor

Here and Now

Without in any sense attempting to detract from the value or belittle the sincerity of the current crop of post-war planning, we still believe that what is now discussed as planning is little better than wishful thinking.

We are of the opinion that post-war planning can only be couched in the broadest terms, and based on fundamentals of philosophy and policies, rather than practices and procedures. And because this is true, we are convinced that they will emerge best fitted to take care of the problems of tomorrow who make the most intelligent and realistic use of the opportunities of today. Perhaps the greatest single opportunity offered under today's conditions is that of service—service to the nation at large, to be sure, but more particularly service to the millions of homes that go to make up the American pattern of living.

Dealers in LP-Gas are in a particularly favored position to render the kind of service during the war that will assure them a position of confidence and trust in the minds of their consumers after the hostilities have ceased. Service in the past has been a much abused word.

It has taken on a new and more dignified implication in the down-to-earth psychology that the war engenders. It embraces more than the readiness to accept profits politely and to do business graciously. Service today implies anything from the willingness to accept sacrifices at home to the courage to face death, itself, in any corner of the world.

The attention of the entire nation is right now being focused on the necessity of raising and effectively utilizing more food than ever has been produced in our history. It is estimated that this year private family gardens will raise in the aggregate more produce than is normally raised by all of the commercial truck farms put together. So that the full benefits of this production may be realized it will be necessary for every home to put up either by canning or drying for

winter consumption all of the excess of home production over current summertime needs.

As the purveyor of a fuel for cooking, the dealer in butane or propane is already identified in the consumer's mind with the home processing of food. Here will lie, we are convinced, an excellent opportunity for every dealer, regardless of the size of his operations, to further serve his domestic accounts by making his store or his company offices an authoritative source of information on every phase of home-processing of garden and orchard produce and fruit. Home service demonstrators may not be within the range of practical possibilities for most companies, but in the rural and semi-rural communities, where the majority of LP-Gas is sold, their services are not as essential as they are in larger cities where cooking and canning have already become almost lost arts.

The lengths to which a dealer may go in being of service to inexperienced home canners is limited only by his imagination and his willingness to make the effort. Government and state agricultural college bulletins are available, and in most instances can be bought in quantities at a very low price per copy. These could be carried on hand, with a complete bibliography of the literature compiled and distributed over the dealer's imprint as a bill stuffer or in postcard form.

Canning demonstrations could be arranged in communities where the cooking habits of the housewives would indicate the necessity for instruction in the simple techniques of putting up fruits and vegetables.

Dealers who regularly advertise in their local papers could carry seasonal copy, stressing in each advertisement the fruits or vegetables then at the peak of their season, with instructions for processing those which are most plentiful.

To avoid waste of surplus, many home gardeners have regularly followed the practise of exchanging varieties of which they have a surplus for other kinds of a neighbor's. A victory garden produce exchange could be organized and carried on by the dealer with nothing more elaborate than a bulletin board on which the names, addresses and kinds of vegetable available from each garden could be listed with the kinds for which the grower would be willing to trade.

The war has brought a return of realism, along with an appreciation of the fact that individual efficiency is directly related to the proper kinds and amounts of food, well prepared and appetizingly served. The point ration system has taken the can opener for a ride and the makeshift cook has been converted to a serious and conscientious home dietician.

Here lies this summer's golden opportunity for LP-Gas to be

of real service to its consumers and to become permanently identified with the new trend toward self-sufficiency in the home. It is a trend ready-made for intelligent and profitable exploitation by the industry.

Deadheads

With cylinders unobtainable, with an increasing gas send-out to existing domestic consumers occasioned by the shortage of fuel oil, and under conditions that make necessary the spacing of deliveries at longer intervals, we believe that the time has come when LP-Gas dealers can no longer allow themselves the sentimental concession of catering to the part-time users of propane.

Summer homes, mountain cabins, week-end cottages all fall under this category, tying up valuable critical materials, badly needed equipment and serving no purpose other than catering to a peace-time convenience that can now be classed as nothing short of luxury.

Seasonal users of LP-Gas have always been considered unprofitable customers by many dealers, yet the problem of discontinuing service to them has been a delicate one. Now under the stress of national emergency conditions a step that has long been indicated as sound from a business standpoint is more than justified by the exigencies of war. To put it bluntly, it's a chance that no dealer should overlook to eliminate seasonal deadheads, and put all of his equipment to work caring for the most essential and the most profitable load.

★ ★ ★

A recently issued suspension order against a butane dealer for violation of Order L-86 need not be construed as an indication of wholesale punitive action against the industry by the Compliance Division of WPB. The very fact that the company under suspension was warned as long ago as May, 1942, to cease making unauthorized installations, and that it continued to sell new equipment, according to WPB, in at least fifteen instances after that date, shows a forbearance and patience on the part of this important war agency that we had never believed existed. New installations that come to the attention of WPB now are being checked to see whether or not applications have been granted, and we are definitely of the opinion that any unauthorized jobs from now on are due for a quick and heavy crack-down. To the great majority of the industry such warning is not necessary, but to those who might be tempted to liberalize the terms of L-86 for their own benefit, we trust that the implications of such a warning will not be overlooked.

Demurrage Charge Keeps Cylinders on the Move

By CRAIG ESPY
Based on an interview with
WALTER A. NAUMER
Manager, "Pyrofax" Gas Division, Carbide and Carbon Chemicals Corp., New York City

CYLINDER turnover has always been an important problem in the liquefied petroleum gas industry and now, with no new cylinders obtainable except for important Government projects, it is particularly acute. Therefore, the successful operation of any plan that will result in faster turnover of equipment can be of benefit, by example, to dealers everywhere.

This is the current type "H" "Pyrofax" equipment installed on consumers' premises.

This is an account of the rules and policies governing the handling of cylinders by the "Pyrofax" Gas Division of the Carbide and Carbon Chemicals Corp., New York City.

Essentially, cylinder turnover is the supplier's problem rather than that of the customer insofar as it relates to capital investment, an angle which is not too readily understood by many householders. Hence, it is necessary to make suitable explanations to the user and then enlist his assistance by pointing out the benefits accruing to him through company cooperation in keeping down to a minimum the number of cylinders outstanding on his premises. To accomplish that end it is found that constantly hammering away at every opportunity is the best way to produce the desired result, and eventually does.

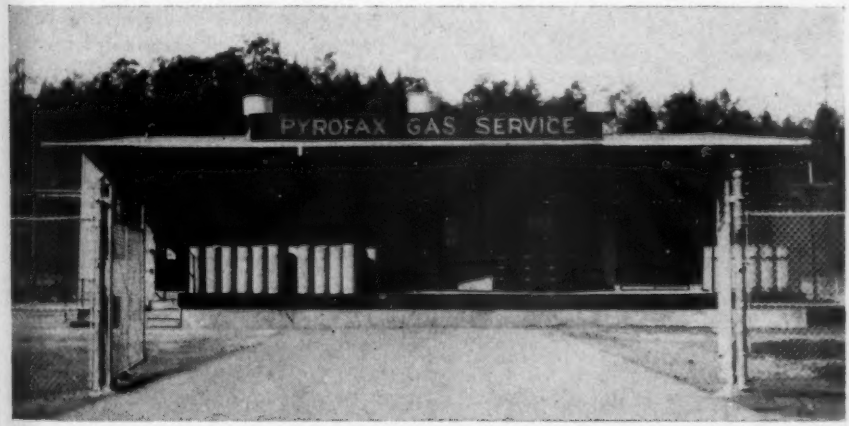
Cylinder demurrage is the crux of the cylinder turnover policy. The company loans "Pyrofax" gas cylinders of 100 lb. capacity to consumers for a maximum period of 12 months without charge. When any such cylinder remains in the consumer's possession longer than the named period, a 50-cent charge

per month is imposed. In like manner, a 50-cent-per-month charge is made on 50-lb. cylinders held longer than six months.

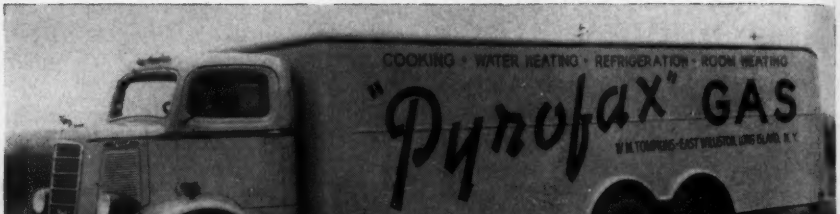
Cylinder demurrage has been a common practice in the compressed gas industry for years. Prior to 1937, however, it was not used in our industry except on cylinders in which industrial gases were supplied to manufacturers. It was introduced to domestic consumers carefully as it was not known whether it would be as readily understood by housewives as it was by business men. There were questions raised by consumers at first, as there usually are in any innovation, and these were satisfactorily answered. Thanks to an educational program, it can truthfully be said that it is by far the most equitable and understandable means available for accomplishing the vitally important purpose of keeping cylinders active at all times. The cylinder demurrage charge is explained in the contract with consumers, on gas statements, and more fully in a little booklet entitled, "Cylinder Demurrage."

This booklet answers in detail six questions asked most frequently by gas users who are affected by cylinder demurrage. These questions and brief resumes of the answers are as follows:

1. Is cylinder demurrage billed to all users of "Pyrofax" gas? Answer: No. Demurrage is billed only to those consumers who retain cylinders longer than the free-loan period.
2. What is the cylinder demurrage charge? Answer: There is a demurrage charge of 50 cents monthly on 100-lb. cylinders held longer than 12 months, and 50c per month on 50-lb. cylinders held longer than 6 months.
3. What is the purpose of the cylinder demurrage charge? Answer: To stimulate the frequency with which cylinders can be reused.
4. How can a "limited usage" cus-



This is a typical "Pyrofax" gas filling station where cylinders are brought by distributors from their local warehouses to be refilled. This plant is the property of the company.



This is a typical "Pyrofax" gas distributor's "hauling truck" used for hauling large quantities of cylinders from filling stations to local warehouses.

tomer avoid paying cylinder demurrage? Answer: By notifying dealer as soon as cylinders become empty. (Post cards are provided for this purpose). Orders for gas should be post-dated, showing approximate time when a new cylinder is needed.

5. How does the cylinder demurrage charge affect seasonal users and tenants? Answer: Seasonal users of small amounts of gas may avoid demurrage charges by having the dealer or distributor pick up cylinders at the close of season, regardless of the amount of gas remaining in them.
6. Why should a customer sign the application for "Pyrofax" gas? Answer: The signing of an application by the customer guarantees the user service for minimum period of three years and enables the company to foresee its future needs.

The company makes it a practice to utilize every possible channel to keep consumers conscious of the importance of cylinder turnover—particularly during the current emergency.

Every "Pyrofax" gas user is supplied with a calendar each year. On the 1943 calendar the statement, "Steel is Precious—Return Empty Cylinders Promptly" appears on the front of each calendar page. Consumer cooperation is again enlisted on the back of the calendar and in the wording of the gas order cards. In addition, there was mailed an "Important Notice" to all consumers with the calendar this year encouraging them to help their distributors save tires and gasoline, make sure that their gas burning appliances are in good repair, not to waste gas in the kitchen. These precautions, plus the general advice on how to operate "Pyrofax" gas equipment according to prescribed rules, all contribute to more efficient use of the fuel and more efficient operation of the business.

Statement envelope enclosures in the form of blotters are also util-

ized for this purpose. The importance of cylinder turnover is explained in its most simple terms in each of the enclosed blotters.

Truck Posters Repeat Message

Every "Pyrofax" gas distributor is supplied with truck posters at no charge. During the past year, the subject of these posters has always been the importance of returning cylinders promptly and keeping them in active use. The company has adopted the practice of reproducing truck posters on small stickers which are used on correspondence to consumers and distributors alike. These stickers are also supplied to distributors upon request who have used them in countless ways, including affixing them to cylinders and gas burning appliances as well as on delivery tickets and gas statements.

Published quarterly is a house organ for "Pyrofax" gas users that is called *Modern Home News*. Editorially, and otherwise, the subject of cylinders is featured prominently in each issue. On the back of the publications the space is utilized to reproduce the truck posters and additional cylinder messages which are directed to users' attention through other channels.

Good Example to Follow

It is quite evident that the importance placed upon gas cylinder control by the "Pyrofax" Gas Division of Carbide and Carbon Chemicals Corp. offers a sound example for all LP-Gas men to follow regarding that phase of industry business. Especially is that true now when every idle cylinder may deprive some essential defense worker of needed gas, and thus retard the united war effort to just that degree.

PLEASE MAIL THIS CARD — **IMMEDIATELY WHEN A CYLINDER BECOMES EMPTY. KEEP CYLINDERS AT WORK . . . SAVE DEMURRAGE!**

PICK UP _____ (QUANTITY) **empty "Pyrofax" gas cylinder(s)**

DELIVER _____ (QUANTITY) **full "Pyrofax" gas cylinder(s)**

SIGN HERE ☞ _____ (NAME)

STREET OR R. D. _____ TOWN _____

Check below when delivery is needed. If cylinder in use will last several months, POST-DATE order to one month before cylinder in use will be exhausted.

☐ ON NEXT TRIP OR ☐ WITHIN NEXT 30 DAYS

or (specify period)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1st to 15th	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
16th to 31st	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

REMARKS _____

Postcard form for ordering delivery of gas or pick-up of empty cylinder.

New Fractionating Unit Begins Operation in May

By WILL C. GRANT
Advertising Director, Lone Star Gas Co., Dallas, Texas

LONE Star Producing Co.'s 25-mile gasoline pipe line of 4½-inch diameter from Ranger, Texas, to Brooks Plant in Breckenridge, Texas, has been completed and it will feed the company's new central fractionating plant at Ranger which is scheduled to begin operations in May. Practically all of the pumps, engines and other equipment for the plant were salvaged from second-hand materials to save critical supplies for war.

Lone Star Producing Co.'s A. L. Williams, left, storekeeper on the pipe line construction, and J. A. Bates, superintendent of company's Brooks Plant at Breckenridge.

The fractionating plant, located three miles southwest of Ranger, will process natural gasoline into components used in making airplane fuel. It will take gasoline from the company's Brooks Plant through the new line and through a line from the company's Plant 108 in Ranger. Tank trucks will deliver gasoline from plants at Gordon and Pueblo. From the gasoline, isobutane, normal butane, isopentane, normal pentane and heavier hydrocarbons will be processed. Isopentane and isobutane are used for blending with refinery stocks to make aviation gasoline from 90 to 100 octane grade.

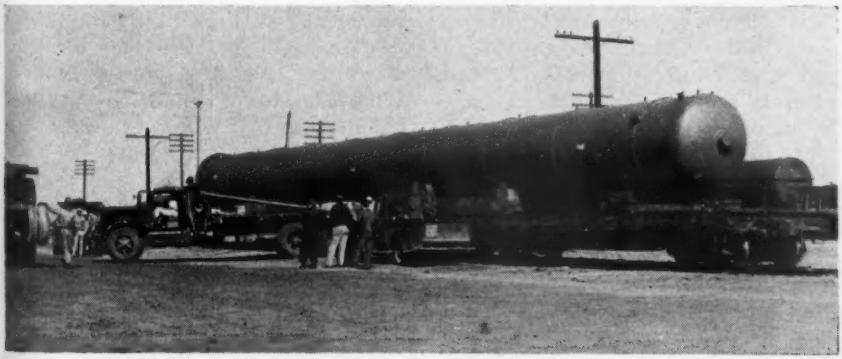
Two giant steel towers have been installed at the Ranger plant for processing the natural gasoline. One is 112 ft. high by 7 ft. diameter, weighing 140,000 lbs., and the other is 112 by 4 ft. The large tower is the deisopentanizer, the smaller the deisobutanizer.

Construction of the new plant is under direction of Harry Wheeldon, Dallas, assistant superintendent of gasoline plants, and John Kindle of

To protect against corrosion, pipe was enameled and wrapped with asbestos felt. At left is L. S. Spencer, foreman for the Sharmon and Allen Co. of Houston, Texas, contractors who laid line for Lone Star Producing Co.

Ranger, superintendent of Lone Star Producing Co.'s Ranger district.

The Ranger-Breckenridge gasoline pipe line was constructed by the Sharmon and Allen Co. of Houston, Texas, and pipe was strung along the right-of-way by L. T. Campbell, trucking contractor. Supervising for Lone Star were R. Vandercook, pipe line superintendent, and Luther Tolbert, assistant pipe line superintendent. Lone Star men on the pipe line project were Earl Miller, construction inspector; Vernon Lackey, welder foreman, and A. L. Williams, storekeeper.



This giant steel tower is part of equipment at Lone Star Producing Co.'s new central fractionating plant at Ranger which is scheduled to begin operations in May. It is 112 by 7 ft. and weighs 140,000 lbs.

THE BOTTLED GAS MANUAL

Chapter 19

Part I.

Competitive Fuels —Oil—

OUR past two evenings together have been spent in the study of natural or unprocessed. fuels. We have observed their lack of uniform chemical structure and heat content. Tonight we shall enter a new world through the door to the chemist's laboratory, and we can tell with a far greater degree of accuracy what values we are buying and what results we have a right to expect.

Tonight, as we sit here we are enjoying the benefits of oil heat, and because of a series of records which I have kept over a period of years I can tell you almost to a gill what the oil consumption will be and what every drop of one degree in temperature means in additional fuel required. It is truly a wonderful feeling to be back upon firm ground again, away from the uncertain values of coal and wood, and to be able to talk concrete figures, thanks to the precision of modern science.

Let us turn back to the record of our first evening together. Then we learned something of our family tree, and if we had traced it farther we would have come to high-test gasolines, kerosene, fuel oils, and myriads of other products from the oil well. Tonight we shall discuss a few of our family cousins.

It was not so long ago that the only product of the oil well that was considered worth-while was kerosene. It lighted the homes of our nation. It begat the evil smelling, mussy and dangerous oil stove, which, in its day, was considered an epic advancement from the coal or wood range. The chill was removed from the guest's bedroom by the portable oil stove, and, thanks to its vagaries, the interior decorator, the fire department and the undertaker did thriving businesses. In those days reservoirs were constructed at some distance from the refineries to get rid of all other products, and Pennsylvania hillsides still show the scars of the fires from such dumps. Quite frequently a refiner found himself in trouble with the law because of either attempting to rid himself of an unwanted product by dumping it in the neighboring creek or because his cupidity tempted him to run the lighter products into his kerosene, this to the peril of his customers.

The coming of the automobile

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• The Bottled Gas Manual series by C. C. Turner, started in the July, 1941, issue of BUTANE-PROPANE *News* and will continue to be published monthly in chapter form until completed. This series constitutes a valuable text book and field manual that should be invaluable to everyone in the liquefied petroleum gas industry.—*Editor.*

with its internal combustion engine reversed the order of things, and kerosene became the unwanted child. Cracking processes were evolved to make the yield of gasoline greater from each barrel of crude, and new markets for kerosene and the heavier distillates had to be created. The range oil burner was the first product of inventive genius which came to the rescue, and a new petroleum derivative came into being. It was known as "range oil" and in many instances was nothing more or less than the refiner's former kerosene product with a little coloring matter added to it. Many of us can remember the trade practice in those days of selling uncolored kerosene as such, then dumping some coloring matter into the remaining product and selling it to the next fellow as "range oil" at from two to four cents less a gallon! It didn't take the public long to "wise-up" on this fact!

The furnace burner closely followed the range oil burner into existence, and its arrival heralded the forthcoming of new petroleum products known as "fuel oils." The combustion engineer was not long in seeing the advantages of these oils in some industrial heat-treating or processing operations, and still new "cuts" or blends were developed. Millions of gallons of kerosene, range and fuel oils are now annually consumed in the United States, and while gasoline production is what most vitally concerns the refiners today, these other markets have exerted a wonderfully stabilizing influence upon the industry, and you and I would be paying much higher prices for the gasoline which we use in our automobiles if it were not for the revenue which the petroleum refiners find in these heat applications for their by-products.

Fuel oils from different crudes vary somewhat in their heat content, but the product from a particular field will run remarkably uniform, thanks to the ever watchful eye of the chemist. There are scores of fuel oils upon the market, but the product which you regularly buy from your supplier will to all intents and purposes be the same in heat content tomorrow as it is today. A change in brand will sometimes show appreciable differences in performance, but for the most part there is little to be said in favor of one or another company's product. The larger companies *have to* produce good and uniform merchandise in order to stay in business, for the field is a highly competitive one. We can, therefore take average heat values for those grades of oil in which we are interested, and the result will be a set of figures adaptable to all brands.

In our discussion this evening we are not interested in all of the gravities which the market offers, but only the three which we most often encounter. These are kerosene, range oil and furnace oil, the last being called No. 2 fuel oil by some of the producers.

Average Heat Content. The heat content of these three fuels will vary somewhat according to the manufacturer, but the values which we shall use as shown in Table 1, are not far from average

and will serve our purpose well in all computations.

Where These Oils Are Competitive. We shall encounter these three oils competitively in the following places:

Kerosene. In portable oil stoves used for cooking and space heating; also, in a few range burners, and some sleeve-type water heater burners.

Range Oil. In kitchen range oil burners, space heaters, water heaters and some furnaces, or central heating plants.

Furnace Oil. In some types of water heaters, space heaters, and some furnaces or central heating plants.

The Efficiency of Oil As a Fuel. While oil is more flexible in its applications than either coal or wood it still lacks the instantaneous control that is an attribute of gas. It is not possible for us to point to this or that application and say definitely, "Here oil is 20% efficient, there it is 30% efficient." Nor is there, as in our industry, a central authority which refuses its approval unless the appliance reaches certain standards of safety and efficiency. Burners of like characteristics under similar conditions of demand and operation burn almost identically the same amounts of oil, despite the claims of the various manufacturers to the contrary. Our consideration of this matter of efficiency must, therefore, be based upon several factors which are roughly as follows:

1. The classification of oil used.
2. The type of appliance in which it is used.
3. The demand upon the appliance.
4. The conditions of operation.
5. The state of the appliance in relation to cleanliness and adjustment.

The oil burners with which we shall come in contact are five in number and as follows:

1. Simple wick type.
2. Unvented blue flame sleeve type.
3. Vented blue flame sleeve type.
4. Vented pot type burner.
5. Vented gun or rotary type burner.

Customary usage has restricted each one of these types to certain fields. Our consideration of efficiences must take all of the 10 factors into consideration as listed above; therefore, we shall consider the subject in its relation to each application as we progress.

Oil in Domestic Cookery. There are four types of oil burners which

TABLE 1. HEAT CONTENTS OF FUEL OILS

Classification	*Approximate A.P.I. Gravity*	*Approximate Number B.t.u. per Gallon*
Kerosene	42	133300
Range oil	38 to 40	136000
Furnace oil (sometimes called No. 2 fuel)	26.4 Approx.	141800

are adapted to domestic cookery. They are as follows:

1. Simple wick type, using a wick of cotton and having a yellow flame.

2. Unvented blue flame type, having several rings or sleeves, and either a cotton or asbestos wick. This type of burner is the one most generally employed in the two or three burner oil stove.

3. Vented blue flame sleeve type, having several rings or sleeves and an asbestos wick. This type is known as the range oil burner.

4. Vented pot type burner.

The simple wick type burner is pretty much a thing of the past, and I am unable to find sufficient data upon it to give you much information as to its efficiency.

Unvented blue flame oil stoves are in extensive use, and they will be found mostly in places such as summer camps; also, where the user moves frequently, has a light cooking demand, and is limited financially. The consumption varies from 5 to 15 gals. of kerosene per month, depending upon the demand upon the appliance and the watchfulness of the operator. Observation of corresponding jobs handled by propane shows a consumption of from 10 to 30 lbs. per month. Taking the efficiency of the propane cooking appliance as being 60% and the maximum consumption of both kerosene and propane, the corresponding inputs would be $30\times21{,}633=648{,}990$ B.t.u. for propane and

$15\times133{,}300=1{,}999{,}500$ B.t.u.

for kerosene. At 60% efficiency for the propane appliance the effective input would be

$.60\times648{,}990=389{,}394$ B.t.u.,

and the over-all efficiency of the kerosene stove would be

$$\frac{389{,}394}{1{,}999{,}500}=19.4\%$$

At first thought it would seem that on the basis of efficiencies, alone, the propane range could give the kerosene stove a merciless whipping, but closer observation of the above figures will show that in such types of usage 2 lbs. of propane are required for every gallon of kerosene. This means that propane must sell at a price level per pound of one-half the price of kerosene per gallon to be on a break-even cost basis. There will be those in our industry who will yell to high heaven at the publishing of such facts and claim that competition is impossible upon such a basis. They lose sight of the fact that because of the small volume of business involved as against the relatively large investment in equipment necessary, the majority of such accounts are of doubtful value to the dealer and might be classed as sub-marginal, or undesirable. The very few accounts of this nature that lie in the upper quantity brackets should not be difficult to convert, for their larger usage subjects them to a large dosage of smell, dirt, and inconvenience, and the speed, cleanliness, convenience and accuracy of control obtainable with the propane range should be well worth the few cents per month difference in operating cost.

Vented blue flame or range type burners are in extensive use throughout the United States, and are to be found in the homes of

those in all walks of life. Their uses range from just that of cooking to cooking and water heating, cooking and space heating, and cooking, water heating and space heating. Consumption of fuel varies from 1½ gals. to 5 gals. in 24 hours. These figures are conservative, and in witness of this fact I quote from the service manual of one prominent oil burner manufacturer in Table 2.

It will be found that oil users consume almost definite quantities of oil for the service they demand of a burner, regardless of the size of family served and with the exception of space heating demands. How these quantities stack up in reference to the kitchen range oil burner is shown in Table 3.

Careful inspection of Tables 4 and 5 should convince us that we are more than competitive with the kitchen range oil burner when it is used for cooking alone. Let's do a little cogitating. The average urban American family has breakfast at 7:00, dinner at 12:00, supper at 6:00. Precious little except top burner cooking can be done over a range oil burner unless both burners are in operation,

TABLE 2. OIL CONSUMPTION FOR VARIOUS SIZE BURNERS

Size and Type of Burner	*Average Consumption in Gallons in 24 Hours*
Double 6-in. burner	2 to 6
Single 6-in. burner	1 to 3
Double 8-in. burner	4 to 9
Single 8-in. burner	2 to 6
Single 10-in. burner	3 to 7

TABLE 3. OIL CONSUMPTION IN RELATION TO USE

Quantity of Oil Burned per Day	*Purpose of Usage*
1½ to 2 gals. per day	Cooking exclusively.
2½ to 3 gals. per day	Cooking and water heating.
3½ to 5 gals. per day	Cooking, water heating, and some space heating.

and it takes at least half an hour for a cold stove to be heated up to anywhere near a cooking temperature. At least one meal out of every three requires the use of the oven. If the range oil burner operates 13 hours per day, 7 hours of which are on low flame for a single burner, 4 hours on high flame for a single burner, and 2 hours on high flame for 2 burners the consumption will be somewhere in the vicinity of 1⁷⁄₁₂ gals. Let us give competition the benefit of the doubt and call it only 1½ gals. per day. Table 4 certainly shows us that the price of oil must be at cellar levels in order to compete with propane on the domestic cooking job, and if the consumption of oil is at 2 gals. (which it most generally is), Table 5 shows that the financial advantages of cooking with propane are even more interesting.

Oil in Domestic Cookery and Water Heating. Those of you who are afraid to tackle domestic cooking and water heating against the range oil burner had better take a good look at Tables 6, 7 and 8, which call for daily oil consumptions of

TABLE 4. SHOWING BREAK-EVEN PRICES OF PROPANE ON THE BASIS OF 1½ GALS. DAILY CONSUMPTION OF OIL

(Basis of figures: 30.41 days to the month. 45.6 gals. monthly consumption)

If Price of Oil is Cents Per Gal.	*Monthly Fuel Bill in $ Will Be*	*If the Number of Pounds of Propane Used Per Month to Do the Same Job Is*											
		20	25	30	35	40*	45	50*	60*	70*	80*	90*	100*
		Then the Price of Propane in Cents Per Pound Can Be On a Break-Even Basis											
12.0	5.47	27.3	21.8	18.2	15.6	13.6	12.1	10.9	9.1	7.8	6.8	6.0	5.4
11.8	5.38	26.9	21.5	17.9	15.3	13.4	11.9	10.7	8.9	7.6	6.7	5.9	5.3
11.6	5.28	26.4	21.1	17.6	15.0	13.2	11.7	10.5	8.8	7.5	6.6	5.8	5.2
11.4	5.19	25.9	20.7	17.3	14.8	12.9	11.5	10.3	8.6	7.4	6.4	5.7	P5.1
11.2	5.10	25.5	20.4	17.0	14.5	12.7	11.3	10.2	8.5	7.2	6.3	5.6	5.1
11.0	5.01	25.0	20.0	16.7	14.3	12.5	11.1	10.0	8.3	7.1	6.2	5.5	5.0
10.8	4.92	24.6	19.6	16.4	14.0	12.3	10.9	9.8	8.2	7.0	6.1	5.4	4.9
10.6	4.83	24.1	19.3	16.1	13.8	12.0	10.7	9.6	8.0	6.9	6.0	5.3	4.8
10.4	4.74	23.7	18.9	15.8	13.5	11.8	10.5	9.4	7.9	6.7	5.9	5.2	4.7
10.2	4.65	23.2	18.6	15.5	13.2	11.6	10.3	9.3	7.7	6.6	5.8	5.1	4.6
10.0	4.56	22.8	18.2	15.2	13.0	11.4	10.1	9.1	7.6	6.5	5.7	5.0	4.5
9.8	4.46	22.3	17.8	14.8	12.7	11.1	9.9	8.9	7.4	6.3	5.5	4.9	4.4
9.6	4.37	21.8	17.4	14.5	12.4	10.9	9.7	8.7	7.2	6.2	5.4	4.8	4.3
9.4	4.28	21.4	17.1	14.2	12.2	10.7	9.5	8.5	7.1	6.1	5.3	4.7	4.2
9.2	4.19	20.9	16.7	13.9	11.9	10.4	9.3	8.3	6.9	5.9	5.2	4.6	P4.1
9.0	4.10	20.5	16.4	13.6	11.7	10.2	9.1	8.2	6.8	5.8	5.1	4.5	4.1
8.8	4.01	20.0	16.0	13.3	11.4	10.0	8.9	8.0	6.6	5.7	5.0	4.4	4.0
8.6	3.92	19.6	15.6	13.0	11.2	9.8	8.7	7.8	6.5	5.6	4.9	4.3	3.9
8.4	3.83	19.1	15.3	12.7	10.9	9.5	8.5	7.6	6.3	5.4	4.7	4.2	3.8
8.2	3.73	18.6	14.9	12.4	10.6	9.3	8.2	7.4	6.2	5.3	4.6	4.1	3.7
8.0	3.64	18.2	14.5	12.1	10.4	9.1	8.0	7.2	6.0	5.2	4.5	4.0	3.6
7.8	3.55	17.7	14.2	11.8	10.1	8.8	7.8	7.1	5.9	5.0	4.4	3.9	3.5
7.6	3.46	17.3	13.8	11.5	9.8	8.6	7.6	6.9	5.7	4.9	4.3	3.8	3.4
7.4	3.37	16.8	13.4	11.2	9.6	8.4	P7.2	6.7	5.6	4.8	4.2	P3.6	3.3
7.2	3.28	16.4	13.1	10.9	9.3	8.2	7.2	6.5	5.4	4.6	4.1	3.6	3.2
7.0	3.19	15.9	12.7	10.6	9.1	7.9	7.0	6.3	5.3	4.5	3.9	3.5	P3.1
6.8	3.10	15.5	12.4	10.3	8.8	7.7	6.8	6.2	5.1	4.4	3.8	3.4	3.1
6.6	3.00	15.0	12.0	10.0	8.5	7.5	6.6	6.0	5.0	4.2	3.7	3.3	3.0
6.4	2.91	14.5	11.6	9.7	8.3	7.2	6.4	5.8	4.8	4.1	3.6	3.2	2.9
6.2	2.82	14.1	11.2	9.4	8.0	7.0	6.2	5.6	4.7	4.0	3.5	3.1	2.8
6.0	2.73	13.6	10.9	9.1	7.8	6.8	6.0	5.4	4.5	3.9	3.4	3.0	2.7
5.8	2.64	13.2	10.5	8.8	7.5	6.6	5.8	5.2	4.4	3.7	3.3	2.9	2.6
5.6	2.55	12.7	10.2	8.5	7.2	6.3	5.6	5.1	4.2	3.6	3.1	2.8	2.5
5.4	2.46	12.3	9.8	8.2	7.0	6.1	5.4	4.9	4.1	3.5	3.0	2.7	2.4
5.2	2.37	11.8	9.4	7.9	6.7	5.9	5.2	4.7	3.9	3.3	2.9	2.6	2.3
5.0	2.28	11.4	9.1	7.6	6.5	5.7	5.0	4.5	3.8	3.2	2.8	2.5	2.2
4.8	2.18	10.9	8.7	7.2	6.2	5.4	4.8	4.3	3.6	3.1	2.7	2.4	2.1
4.6	2.09	10.4	8.3	6.9	5.9	5.2	4.6	4.1	3.4	2.9	2.6	2.3	2.0
4.4	2.00	10.0	8.0	6.6	5.7	5.0	4.4	4.0	3.3	2.8	2.5	2.2	2.0
4.2	1.91	9.5	7.6	6.3	5.4	4.7	4.2	3.8	3.1	2.7	2.3	2.1	1.9
4.0	1.82	9.1	7.2	6.0	5.2	4.5	4.0	3.6	3.0	2.6	2.2	2.0	1.8
3.8	1.73	8.6	6.9	5.7	4.9	4.3	3.8	3.4	2.8	2.4	2.1	1.9	1.7
3.6	1.64	8.2	6.5	5.4	4.6	4.1	3.6	3.2	2.7	2.3	2.0	1.8	1.6
3.4	1.55	7.7	6.2	5.1	4.3	3.8	3.4	3.1	2.5	2.1	1.9	1.7	1.5
3.2	1.45	7.2	5.8	4.8	4.1	3.6	3.2	2.9	2.4	2.0	1.8	1.6	1.4
3.0	1.36	6.8	5.5	4.5	3.8	3.4	3.0	2.7	2.2	1.9	1.7	1.5	1.3

In Tables 4-9, inclusive, because of lack of space, computations have been carried out one decimal point only. Where the letter "P" appears before or after a number it signifies that the value of the figure given would exceed that of the next like set of figures if the decimal were carried out farther.

Columns marked by asterisk (*) are by interpolation.

TABLE 5. SHOWING BREAK-EVEN PRICES OF PROPANE ON THE BASIS OF 2 GALS. DAILY CONSUMPTION OF OIL

(Basis of figures: 30.41 days per month. 60.82 gals. monthly consumption)

If Price of Oil is Cents Per Gal.	Monthly Fuel Bill in $ Will Be	If the Number of Pounds of Propane Used Per Month to Do the Same Job Is											
		20	25	30	35	40*	45	50*	60*	70*	80*	90*	100*
		Then the Price of Propane in Cents Per Pound Can Be On a Break-Even Basis											
12.0	7.29	36.4	29.1	24.3	20.8	18.2	16.2	14.5	12.1	10.4	9.1	8.1	7.2
11.8	7.17	35.8	28.6	23.9	20.4	17.9	15.9	14.3	11.9	10.2	8.9	7.9	7.1
11.6	7.05	35.2	28.2	23.5	20.1	17.6	15.6	14.1	11.7	10.0	8.8	7.8	7.0
11.4	6.93	34.6	27.7	23.1	19.8	17.3	15.4	13.8	11.5	9.9	8.6	7.7	6.9
11.2	6.81	34.0	27.2	22.7	19.4	17.0	15.1	13.6	11.3	9.7	8.5	7.5	6.8
11.0	6.69	33.4	26.7	22.3	19.1	16.7	14.8	13.3	11.1	9.5	8.3	7.4	6.6
10.8	6.56	32.8	26.2	21.8	18.7	16.4	14.5	13.1	10.9	9.3	8.2	7.2	6.5
10.6	6.44	32.2	25.7	21.4	18.4	16.2	14.3	12.8	10.1	9.2	8.1	7.1	6.4
10.4	6.32	31.6	25.2	21.0	18.0	15.8	14.0	12.6	10.5	9.0	7.9	7.0	6.3
10.2	6.20	31.0	24.8	20.6	17.7	15.5	13.7	12.4	10.3	8.8	7.7	6.8	6.2
10.0	6.08	30.4	24.3	20.2	17.3	15.2	13.5	12.1	10.1	8.6	7.6	6.7	6.0
9.8	5.96	29.8	23.8	19.8	17.0	14.5	13.2	11.9	9.9	8.5	7.4	6.6	5.9
9.6	5.83	29.1	23.3	19.4	16.6	14.5	12.9	11.6	9.7	8.3	7.2	6.4	5.8
9.4	5.71	28.5	22.8	19.0	16.3	14.2	12.6	11.4	9.5	8.1	7.1	6.3	5.7
9.2	5.59	27.9	22.3	18.6	15.9	13.9	12.4	11.1	9.3	7.9	6.9	6.2	5.5
9.0	5.47	27.3	21.8	18.2	15.6	13.6	12.1	10.9	9.1	7.8	6.8	6.0	5.4
8.8	5.35	26.7	21.4	17.8	15.2	13.3	11.8	10.7	8.9	7.6	6.6	5.9	5.3
8.6	5.23	26.1	20.9	17.4	14.9	13.0	11.6	10.4	8.7	7.4	6.5	5.8	5.2
8.4	5.10	25.5	20.4	17.0	14.5	12.7	11.3	10.2	8.5	7.2	6.3	5.6	5.1
8.2	4.98	24.9	19.9	16.6	14.2	12.4	11.0	9.9	8.3	7.1	6.2	5.5	4.9
8.0	4.86	24.3	19.4	16.2	13.8	12.1	10.8	9.7	8.1	6.9	6.0	5.4	4.8
7.8	4.74	23.7	18.9	15.8	13.5	11.8	10.5	9.4	7.9	6.7	5.9	5.2	4.7
7.6	4.62	23.1	18.4	15.4	13.2	11.5	10.2	9.2	7.7	6.6	5.7	5.1	4.6
7.4	4.50	22.5	18.0	15.0	12.8	11.2	10.0	9.0	7.5	6.4	5.6	5.0	4.5
7.2	4.37	21.8	17.4	14.5	12.4	10.9	9.7	8.7	7.2	6.2	5.4	4.8	4.3
7.0	4.25	21.2	17.0	14.1	12.1	10.6	9.4	8.5	7.0	6.0	5.3	4.7	4.2
6.8	4.13	20.6	16.5	13.7	11.8	10.3	9.1	8.2	6.8	5.9	5.1	4.5	4.1
6.6	4.01	20.0	16.0	13.3	11.4	10.0	8.9	8.0	6.6	5.7	5.0	4.4	4.0
6.4	3.89	19.4	15.5	12.9	11.1	9.7	8.6	7.7	6.4	5.5	4.8	4.3	3.8
6.2	3.77	18.8	15.0	12.5	10.7	9.4	8.3	7.5	6.2	5.3	4.7	4.1	3.7
6.0	3.65	18.2	14.6	12.1	10.4	9.1	8.1	7.3	6.0	5.2	4.5	4.0	3.6
5.8	3.52	17.6	14.0	11.7	10.0	8.8	7.8	7.0	5.8	5.0	4.4	3.9	3.5
5.6	3.40	17.0	13.6	11.3	9.7	8.5	7.5	6.8	5.6	4.8	4.2	3.7	3.4
5.4	3.28	16.4	13.1	10.9	9.3	8.2	7.2	6.5	5.4	4.6	4.1	3.6	3.2
5.2	3.16	15.8	12.6	10.5	9.0	7.9	7.0	6.3	5.2	4.5	3.9	3.5	3.1
5.0	3.04	15.2	12.1	10.1	8.6	7.6	6.7	6.0	5.0	4.3	3.8	3.3	3.0
4.8	2.91	14.5	11.6	9.7	8.3	7.2	6.4	5.8	4.8	4.1	3.6	3.2	2.9
4.6	2.79	13.9	11.1	9.3	7.9	6.9	6.2	5.5	4.6	3.9	3.4	3.1	2.7
4.4	2.67	13.3	10.6	8.9	7.6	6.6	5.9	5.3	4.4	3.8	3.3	2.9	2.6
4.2	2.55	12.7	10.2	8.5	7.2	6.3	5.6	5.1	4.2	3.6	3.1	2.8	2.5
4.0	2.43	12.1	9.7	8.1	6.9	6.0	5.4	4.8	4.0	3.4	3.0	2.7	2.4
3.8	2.31	11.5	9.2	7.7	6.6	5.7	5.1	4.6	3.8	3.3	2.8	2.5	2.3
3.6	2.18	10.9	8.7	7.2	6.2	5.4	4.8	4.3	3.6	3.1	2.7	2.4	2.1
3.4	2.06	10.3	8.2	6.8	5.8	5.1	4.5	4.1	3.4	2.9	2.5	2.2	2.0
3.2	1.94	9.7	7.7	6.4	5.5	4.8	4.3	3.8	3.2	2.7	2.4	2.1	1.9
3.0	1.82	9.1	7.2	6.0	5.2	4.5	4.0	3.6	3.0	2.6	2.2	2.0	1.8

TABLE 6. SHOWING BREAK-EVEN PRICES OF PROPANE ON THE BASIS OF 3 GALS. DAILY CONSUMPTION OF OIL

(Basis of figures: 30.41 days per month. 91.23 gals. monthly consumption)

If Price of Oil is Cents Per Gal.	Monthly Fuel Bill in $ Will Be	If the Number of Pounds of Propane Used Per Month to Do the Same Job Is												
		40	45	50	60	70	80*	90*	100*	110	120*	130	140*	150
		Then the Price of Propane in Cents Per Pound Can Be On a Break-Even Basis												
12.0	10.94	27.3	24.3	21.8	18.2	15.6	13.6	12.1	10.9	9.9	9.1	8.4	7.8	7.2
11.8	10.76	26.9	23.9	21.5	17.9	15.3	13.4	11.9	10.7	9.7	8.9	8.2	7.6	7.1
11.6	10.58	26.4	23.5	21.1	17.6	15.1	13.2	11.7	10.5	9.6	8.8	8.1	7.5	7.0
11.4	10.40	26.0	23.1	20.8	17.3	14.8	13.0	11.5	10.4	9.4	8.6	8.0	7.4	6.9
11.2	10.21	25.5	22.6	20.4	17.0	14.5	12.7	11.3	10.2	9.2	8.5	7.8	7.2	6.8
11.0	10.03	25.0	22.2	20.0	16.7	14.3	12.5	11.1	10.0	9.1	8.3	7.7	7.1	6.6
10.8	9.85	24.6	21.8	19.7	16.4	14.0	12.3	10.9	9.8	8.9	8.2	7.5	7.0	6.5
10.6	9.67	24.1	21.4	19.3	16.1	13.8	12.0	10.7	9.6	8.7	8.0	7.4	6.9	6.4
10.4	9.48	23.7	21.0	18.9	15.8	13.5	11.8	10.5	9.4	8.6	7.9	7.2	6.7	6.3
10.2	9.30	23.2	20.6	18.6	15.5	13.2	11.6	10.3	9.3	8.4	7.7	7.1	6.6	6.2
10.0	9.12	22.8	20.2	18.2	15.2	13.0	11.4	10.1	9.1	8.2	7.6	7.0	6.5	6.0
9.8	8.94	22.3	19.8	17.8	14.9	12.7	11.1	9.9	8.9	8.1	7.4	6.8	6.3	5.9
9.6	8.75	21.8	19.4	17.5	14.5	12.5	10.9	9.7	8.7	7.9	7.2	6.7	6.2	5.8
9.4	8.57	21.4	19.0	17.1	14.2	12.2	10.7	9.5	8.5	7.7	7.1	6.5	6.1	5.7
9.2	8.39	20.9	18.6	16.7	13.9	11.9	10.4	9.3	8.3	7.6	6.9	6.4	5.9	5.5
9.0	8.21	20.5	18.2	16.4	13.6	11.7	10.2	9.2	8.2	7.4	6.8	6.3	5.8	5.4
8.8	8.02	20.0	17.8	16.0	13.3	11.4	10.0	8.9	8.0	7.2	6.6	6.1	5.7	5.3
8.6	7.84	19.6	17.4	15.6	13.0	11.2	9.8	8.7	7.8	7.1	6.5	6.0	5.6	5.2
8.4	7.66	19.1	17.0	15.3	12.7	10.9	9.5	8.5	7.6	6.9	6.3	5.8	5.4	5.1
8.2	7.48	18.7	16.6	14.9	12.4	10.6	9.3	8.3	7.4	6.8	6.2	5.7	5.3	4.9
8.0	7.29	18.2	16.2	14.5	12.1	10.4	9.1	8.1	7.2	6.6	6.0	5.6	5.2	4.8
7.8	7.11	17.7	15.8	14.2	11.8	10.1	8.8	7.9	7.1	6.4	5.9	5.4	5.0	4.7
7.6	6.93	17.3	15.4	13.8	11.5	9.9	8.6	7.7	6.9	6.3	5.7	5.3	4.9	4.6
7.4	6.75	16.8	15.0	13.5	11.2	9.6	8.4	7.5	6.7	6.1	5.6	5.1	4.8	4.5
7.2	6.56	16.4	14.5	13.1	10.9	9.3	8.2	7.2	6.5	5.9	5.4	5.0	4.6	4.3
7.0	6.38	15.9	14.1	12.7	10.6	9.1	7.9	7.0	6.3	5.8	5.3	4.9	4.5	4.2
6.8	6.20	15.5	13.7	12.4	10.3	8.8	7.7	6.8	6.2	5.6	5.1	4.7	4.4	4.1
6.6	6.02	15.0	13.3	12.0	10.0	8.6	7.5	6.6	6.0	5.4	5.0	4.6	4.3	4.0
6.4	5.83	14.5	12.9	11.6	9.7	8.3	7.2	6.4	5.8	5.3	4.8	4.4	4.1	3.8
6.2	5.65	14.1	12.5	11.3	9.4	8.0	7.0	6.2	5.6	5.0	4.7	4.3	4.0	3.7
6.0	5.47	13.6	12.1	10.9	9.1	7.8	6.8	6.0	5.4	4.9	4.5	4.2	3.9	3.6
5.8	5.29	13.2	11.7	10.5	8.8	7.5	6.6	5.8	5.2	4.8	4.4	4.0	3.7	3.5
5.6	5.10	12.7	11.3	10.2	8.5	7.2	6.3	5.6	5.1	4.6	4.2	3.9	3.6	3.4
5.4	4.92	12.3	10.9	9.8	8.2	7.0	6.1	5.4	4.9	4.4	4.1	3.7	3.5	3.2
5.2	4.74	11.8	10.5	9.4	7.9	6.7	5.9	5.2	4.7	4.3	3.9	3.6	3.3	3 1
5.0	4.56	11.4	10.1	9.1	7.6	6.5	5.7	5.0	4.5	4.1	3.8	3.5	3.2	3.0
4.8	4.37	10.9	9.7	8.7	7.2	6.2	5.4	4.8	4.3	3.9	3.6	3.3	3.1	2.9
4.6	4.19	10.4	9.3	8.3	6.9	5.9	5.2	4.6	4.1	3.8	3.4	3.2	2.9	2.7
4.4	4.01	10.0	8.9	8.0	6.6	5.7	5.0	4.4	4.0	3.6	3.3	3.0	2.8	2.6
4.2	3.83	9.5	8.5	7.6	6.3	5.4	4.7	4.2	3.8	3.4	3.1	2.9	2.7	2.5
4.0	3.64	9.1	8.0	7.2	6.0	5.2	4.5	4.0	3.6	3.3	3.0	2.8	2.6	2.4
3.8	3.46	8.6	7.6	6.9	5.7	4.9	4.3	3.8	3.4	3.0	2.8	2.6	2.4	2.3
3.6	3.28	8.2	7.2	6.5	5.4	4.6	4.1	3.6	3.2	2.9	2.7	2.5	2.3	2.1
3.4	3.10	7.7	6.8	6.2	5.1	4.4	3.8	3.4	3.1	2.8	2.5	2.3	2.2	2.0
3.2	2.91	7.2	6.4	5.8	4.8	4.1	3.6	3.2	2.9	2.6	2.4	2.2	2.0	1.9
3.0	2.73	6.8	6.0	5.4	4.5	3.9	3.4	3.0	2.7	2.4	2.2	2.1	1.9	1.8

TABLE 7. SHOWING BREAK-EVEN PRICES OF PROPANE ON THE BASIS OF 3½ GALS. DAILY CONSUMPTION OF OIL.

(Basis of figures: 30.41 days per month. 106.43 gallons monthly consumption)

If Price of Oil Is Cents Per Gal.	Monthly Fuel Bill in $ Will Be	If the Number of Pounds of Propane Used Per Month to Do the Same Job Is												
		45	50	60	70	80	90*	100*	110	120*	130	140*	150	160*
		Then the Price of Propane in Cents Per Pound Can Be On a Break-Even Basis												
12.0	12.77	28.3	25.5	21.2	18.2	15.9	14.1	12.7	11.6	10.6	9.8	9.1	8.5	7.9
11.8	12.55	27.8	25.1	20.9	17.9	15.6	13.9	12.5	11.4	10.4	9.6	8.9	8.3	7.8
11.6	12.34	27.4	24.6	20.5	17.6	15.4	13.7	12.3	11.2	10.2	9.4	8.8	8.2	7.7
11.4	12.13	26.9	24.2	20.2	17.4	15.1	13.4	12.1	11.0	10.1	9.3	8.7	8.0	7.5
11.2	11.92	26.4	23.8	19.8	17.0	14.9	13.2	11.9	10.8	9.9	9.1	8.5	7.9	7.4
11.0	11.70	26.0	23.4	19.5	16.7	14.6	13.0	11.7	10.6	9.7	9.0	8.3	7.8	7.3
10.8	11.49	25.5	22.9	19.1	16.4	14.3	12.7	11.4	10.4	9.5	8.8	8.2	7.6	7.1
10.6	11.28	25.0	22.5	18.8	16.1	14.1	12.5	11.2	10.2	9.4	8.6	8.0	7.5	7.0
10.4	11.06	24.5	22.1	18.4	15.8	13.8	12.2	11.0	10.0	9.2	8.5	7.9	7.3	6.9
10.2	10.85	24.1	21.7	18.0	15.5	13.5	12.0	10.8	9.8	9.0	8.3	7.7	7.2	6.7
10.0	10.64	23.5	21.2	17.7	15.2	13.3	11.7	10.6	9.6	8.8	8.1	7.6	7.0	6.6
9.8	10.43	23.1	20.8	17.3	14.9	13.0	11.5	10.4	9.4	8.6	8.0	7.4	6.9	6.5
9.6	10.21	22.6	20.4	17.0	14.5	12.7	11.3	10.2	9.2	8.5	7.8	7.2	6.8	6.3
9.4	10.00	22.2	20.0	16.6	14.2	12.5	11.1	10.0	9.0	8.3	7.6	7.1	6.6	6.2
9.2	9.79	21.7	19.5	16.3	13.9	12.2	10.8	9.7	8.9	8.1	7.5	6.9	6.5	6.1
9.0	9.57	21.2	19.1	15.9	13.6	11.9	10.6	9.5	8.7	7.9	7.3	6.8	6.3	5.9
8.8	9.36	20.8	18.7	15.6	13.3	11.7	10.4	9.3	8.5	7.8	7.2	6.6	6.2	5.8
8.6	9.15	20.3	18.3	15.2	13.0	11.4	10.1	9.1	8.3	7.6	7.0	6.5	6.1	5.7
8.4	8.94	19.8	17.8	14.9	12.7	11.1	9.9	8.9	8.1	7.4	6.8	6.3	5.9	5.5
8.2	8.72	19.3	17.4	14.5	12.4	10.9	9.6	8.7	7.9	7.2	6.7	6.2	5.8	5.4
8.0	8.51	18.9	17.0	14.1	12.1	10.6	9.4	8.5	7.7	7.0	6.5	6.0	5.6	5.3
7.8	8.30	18.4	16.6	13.8	11.8	10.3	9.2	8.3	7.5	6.9	6.3	5.9	5.5	5.1
7.6	8.08	17.9	16.1	13.4	11.5	10.1	8.9	8.0	7.3	6.7	6.2	5.7	5.3	5.0
7.4	7.87	17.4	15.7	13.1	11.2	9.8	8.7	7.8	7.1	6.5	6.0	5.6	5.2	4.9
7.2	7.66	17.0	15.3	12.7	10.9	9.5	8.5	7.6	6.9	6.3	5.8	5.4	5.1	4.7
7.0	7.45	16.5	14.9	12.4	10.6	9.3	8.2	7.4	6.7	6.2	5.7	5.3	4.9	4.6
6.8	7.23	16.0	14.4	12.0	10.3	9.0	8.0	7.2	6.5	6.0	5.5	5.1	4.8	4.5
6.6	7.02	15.6	14.0	11.7	10.0	8.7	7.8	7.0	6.3	5.8	5.4	5.0	4.6	4.3
6.4	6.81	15.1	13.6	11.3	9.7	8.5	7.5	6.8	6.1	5.6	5.2	4.8	4.5	4.2
6.2	6.59	14.6	13.1	10.9	9.4	8.2	7.3	5.5	5.9	5.4	5.0	4.7	4.3	4.1
6.0	6.38	14.1	12.7	10.6	9.1	7.9	7.0	6.3	5.8	5.3	4.9	4.5	4.2	3.9
5.8	6.17	13.7	12.3	10.2	8 8	7.7	6.8	6.1	5.6	5.1	4.7	4.4	4.1	3.8
5.6	5.96	13.2	11.9	9.9	8.5	7.4	6.6	5.9	5.4	4.9	4.5	4.2	3.9	3.7
5.4	5.74	12.7	11.4	9.5	8.2	7.1	6.3	5.7	5.2	4.7	4.4	4.1	3.8	3.5
5.2	5.53	12.2	11.0	9.2	7.9	6.9	6.1	5.5	5.0	4.6	4.2	3.9	3.6	3.4
5.0	5.32	11.8	10.6	8.8	7.6	6.6	5.9	5.3	4.8	4.4	4.0	3.8	3.5	3.3
4.8	5.10	11.3	10.2	8.5	7.2	6.3	5.6	5.1	4.6	4.2	3.9	3.6	3.4	3.1
4.6	4.89	10.7	9.7	8.1	6 9	6.1	5.3	4.8	4.4	4.0	3.7	3.4	3.2	3.0
4.4	4.68	10.4	9.3	7.8	6.6	5.8	5.2	4.6	4.2	3.9	3.6	3.3	3.1	2.9
4.2	4.47	9.9	8.9	7.4	6 3	5.5	4.9	4.4	4.0	3.7	3.4	3.1	2.9	2.7
4.0	4.25	9.4	8.5	7.0	6.0	5.3	4.7	4.2	3.8	3.5	3.2	3.0	2.8	2.6
3.8	4.04	8.9	8.0	6.7	5.7	5.0	4.4	4.0	3.6	3.3	3.1	2.8	2.6	2.5
3.6	3.83	8.5	7.6	6.3	5.4	4.7	4.2	3.8	3.4	3.1	2 9	2.7	2.5	2.3
3.4	3.61	8.0	7.2	6.0	5.1	4.5	4.0	3.6	3.2	3.0	2.7	2.5	2.4	2.2
3.2	3.40	7.5	6.8	5.6	4.8	4.2	3.7	3.4	3.0	2.8	2.6	2.4	2.2	2.1
3.0	3.19	7.0	6.3	5.3	4.5	3.9	3.5	3.1	2.9	2.6	2.4	2.2	2.1	1.9

TABLE 8. SHOWING BREAK-EVEN PRICES OF PROPANE ON THE BASIS OF 4 GALS. DAILY CONSUMPTION OF OIL

(Basis of figures: 30.41 days per month. 121.64 gals. monthly consumption)

If Price of Oil is Cents Per Gal.	Monthly Fuel Bill in $ Will Be	If the Number of Pounds of Propane Used Per Month to Do the Same Job Is												
		50	60	70	80	90	100*	110	120*	130	140*	150	160*	170
		Then the Price of Propane in Cents Per Pound Can Be On a Break-Even Basis												
12.0	14.59	29.1	24.3	20.8	18.2	16.2	14.5	13.2	12.1	11.2	10.4	9.7	9.1	8.5
11.8	14.35	28.7	23.9	20.5	17.9	15.9	14.3	13.0	11.9	11.0	10.2	9.5	8.9	8.4
11.6	14.11	28.2	23.5	20.1	17.6	15.6	14.1	12.8	11.7	10.8	10.0	9.4	8.8	8.3
11.4	13.86	27.7	23.1	19.8	17.3	15.4	13.8	12.6	11.5	10.6	9.9	9.2	8.6	8.1
11.2	13.62	27.2	22.7	19.4	17.0	15.1	13.6	12.3	11.3	10.4	9.7	9.0	8.5	8.0
11.0	13.38	26.7	22.3	19.1	16.6	14.8	13.3	12.1	11.1	10.2	9.5	8.9	8.3	7.8
10.8	13.13	26.2	21.8	18.7	16.4	14.5	13.1	11.9	10.9	10.1	9.3	8.7	8.2	7.7
10.6	12.89	25.7	21.4	18.4	16.1	14.3	12.8	11.7	10.7	9.9	9.2	8.5	8.0	7.5
10.4	12.65	25.3	21.0	18.0	15.8	14.0	12.6	11.5	10.5	9.7	9.0	8.4	7.9	7.4
10.2	12.40	24.8	20.6	17.7	15.5	13.7	12.4	11.2	10.3	9.5	8.8	8.2	7.7	7.2
10.0	12.16	24.3	20.2	17.3	15.2	13.5	12.1	11.0	10.1	9.3	8.6	8.1	7.6	7.1
9.8	11.92	23.8	19.8	17.0	14.9	13.2	11.9	10.8	9.9	9.1	8.5	7.9	7.4	7.0
9.6	11.67	23.3	19.4	16.6	14.5	12.9	11.6	10.5	9.7	8.9	8.3	7.7	7.2	6.8
9.4	11.43	22.8	19.0	16.3	14.2	12.7	11.4	10.3	9.5	8.7	8.1	7.6	7.1	6.7
9.2	11.19	22.3	18.6	15.9	13.9	12.4	11.1	10.1	9.3	8.6	7.9	7.4	6.9	6.5
9.0	10.94	21.8	18.2	15.6	13.6	12.1	10.9	9.9	9.1	8.4	7.8	7.2	6.8	6.4
8.8	10.70	21.4	17.8	15.2	13.3	11.8	10.7	9.7	8.9	8.2	7.6	7.1	6.6	6.2
8.6	10.46	20.9	17.4	14.9	13.0	11.6	10.4	9.5	8.7	8.0	7.4	6.9	6.5	6.1
8.4	10.21	20.4	17.0	14.5	12.7	11.3	10.2	9.2	8.5	7.8	7.2	6.8	6.3	6.0
8.2	9.97	19.9	16.6	14.2	12.4	11.0	9.9	9.0	8.3	7.6	7.1	6.6	6.2	5.8
8.0	9.73	19.4	16.2	13.9	12.1	10.8	9.7	8.8	8.1	7.4	6.9	6.4	6.0	5.7
7.8	9.48	18.9	15.8	13.5	11.8	10.5	9.4	8.6	7.9	7.2	6.7	6.3	5.9	5.5
7.6	9.24	18.4	15.4	13.2	11.5	10.2	9.2	8.4	7.7	7.1	6.6	6.1	5.7	5.4
7.4	9.00	18.0	15.0	12.8	11.2	10.0	9.0	8.1	7.5	6.9	6.4	6.0	5.6	5.2
7.2	8.75	17.5	14.5	12.5	10.9	9.7	8.7	7.9	7.2	6.7	6.2	5.8	5.4	5.1
7.0	8.51	17.0	14.1	12.1	10.6	9.4	8.5	7.7	7.0	6.5	6.0	5.6	5.3	5.0
6.8	8.27	16.5	13.7	11.7	10.3	9.1	8.2	7.5	6.8	6.3	5.8	5.5	5.1	4.8
6.6	8.02	16.0	13.3	11.4	10.0	8.9	8.0	7.2	6.6	6.1	5.7	5.3	5.0	4.7
6.4	7.78	15.5	12.9	11.1	9.7	8.6	7.7	7.0	6.4	5.9	5.5	5.1	4.8	4.5
6.2	7.54	15.0	12.5	10.7	9.4	8.3	7.5	6.8	6.2	5.8	5.3	5.0	4.7	4.4
6.0	7.29	14.5	12.1	10.4	9.1	8.1	7.2	6.6	6.0	5.6	5.2	4.8	4.5	4.3
5.8	7.05	14.1	11.7	10.0	8.8	7.8	7.0	6.4	5.8	5.4	5.0	4.7	4.4	4.1
5.6	6.81	13.6	11.3	9.7	8.5	7.5	6.8	6.1	5.6	5.2	4.8	4.5	4.2	4.0
5.4	6.56	13.1	10.9	9.3	8.2	7.2	6.5	5.9	5.4	5.0	4.6	4.3	4.1	3.8
5.2	6.32	12.6	10.5	9.0	7.9	7.0	6.3	5.7	5.2	4.8	4.5	4.2	3.9	3.7
5.0	6.08	12.1	10.1	8.6	7.6	6.7	6.0	5.5	5.0	4.6	4.3	4.0	3.8	3.5
4.8	5.83	11.6	9.7	8.3	7.2	6.4	5.8	5.3	4.8	4.4	4.1	3.8	3.6	3.4
4.6	5.59	11.1	9.3	7.9	6.9	6.2	5.5	5.0	4.6	4.3	3.9	3.7	3.4	3.2
4.4	5.35	10.7	8.9	7.6	6.6	5.9	5.3	4.8	4.4	4.1	3.8	3.5	3.3	3.1
4 2	5.10	10.2	8.5	7.2	6.3	5.6	5.1	4.6	4.2	3.9	3.6	3.4	3.1	3.0
4.0	4.86	9.7	8.1	6.9	6.0	5.4	4.8	4.4	4.0	3.7	3.4	3.2	3.0	2.8
3.8	4.62	9.2	7.7	6.6	5.7	5.1	4.6	4.2	3.8	3.5	3.3	3.0	2.8	2.7
3.6	4.37	8.7	7.2	6.2	5.4	4.8	4.3	3.9	3.6	3.3	3.1	2.9	2.7	2.5
3.4	4.13	8.2	6.8	5.9	5.1	4.5	4.1	3.7	3.4	3.1	2.9	2.7	2.5	2.4
3.2	3.89	7.7	6.4	5.5	4.8	4.3	3.8	3.5	3.2	2.9	2.7	2.5	2.4	2.2
3.0	3.64	7.2	6.0	5.2	4.5	4.0	3.6	3.3	3.0	2.8	2.6	2.4	2.2	2.1

TABLE 9. SHOWING BREAK-EVEN PRICES OF PROPANE ON THE BASIS OF 5 GALS. DAILY CONSUMPTION OF OIL

(Basis of figures: 30.41 days per month. 152.05 gals. monthly consumption)

If Price of Oil is Cents Per Gal.	Monthly Fuel Bill in $ Will Be	If the Number of Pounds of Propane Used Per Month to Do the Same Job Is												
		70	80	90	100	110	120	130	140	150	160	170	180	190
		Then the Price of Propane in Cents Per Pound Can Be On a Break-Even Basis												
12.0	18.24	26.0	22.8	20.2	18.2	16.5	15.2	14.0	13.0	12.1	11.4	10.7	10.1	9.6
11.8	17.94	25.6	22.4	19.9	17.9	16.3	14.9	13.8	12.8	11.9	11.2	10.5	9.9	9.4
11.6	17.63	25.1	22.0	19.5	17.6	16.0	14.6	13.5	12.5	11.8	11.0	10.3	9.7	9.2
11.4	17.33	24.7	21.6	19.2	17.3	15.7	14.4	13.3	12.3	11.6	10.8	10.1	9.6	9.1
11.2	17.02	24.3	21.2	18.9	17.0	15.4	14.1	13.0	12.1	11.4	10.6	10.0	9.4	8.9
11.0	16.72	23.8	20.9	18.5	16.7	15.2	13.9	12.8	11.9	11.1	10.4	9.8	9.2	8.8
10.8	16.42	23.4	20.5	18.2	16.4	14.9	13.6	12.6	11.7	10.9	10.2	9.6	9.1	8.6
10.6	16.11	23.0	20.1	17.9	16.1	14.6	13.4	12.3	11.5	10.8	10.0	9.4	8.9	8.4
10.4	15.81	22.5	19.7	17.5	15.8	14.3	13.1	12.1	11.2	10.6	9.8	9.3	8.7	8.3
10.2	15.50	22.1	19.3	17.2	15.5	14.0	12.9	11.9	11.0	10.3	9.6	9.1	8.6	8.1
10.0	15.20	21.7	19.0	16.8	15.2	13.8	12.6	11.6	10.8	10.1	9.5	8.9	8.4	8.0
9.8	14.90	21.2	18.6	16.5	14.9	13.5	12.4	11.4	10.6	9.9	9.3	8.7	8.2	7.8
9.6	14.59	20.8	18.2	16.2	14.5	13.2	12.1	11.2	10.4	9.7	9.1	8.5	8.1	7.6
9.4	14.29	20.4	17.8	15.8	14.2	12.9	11.9	10.9	10.2	9.5	8.9	8.4	7.9	7.5
9.2	13.98	19.9	17.4	15.5	13.9	12.7	11.6	10.7	9.9	9.3	8.7	8.2	7.7	7.3
9.0	13.68	19.5	17.1	15.2	13.6	12.4	11.4	10.5	9.7	9.1	8.5	8.0	7.6	7.2
8.8	13.38	19.1	16.6	14.8	13.3	12.1	11.1	10.2	9.5	8.9	8.3	7.8	7.4	7.0
8.6	13.07	18.6	16.3	14.5	13.0	11.8	10.8	10.0	9.3	8.7	8.1	7.6	7.2	6.8
8.4	12.77	18.2	15.9	14.1	12.7	11.6	10.6	9.8	9.1	8.5	7.9	7.5	7.0	6.7
8.2	12.46	17.8	15.5	13.8	12.4	11.3	10.3	9.5	8.9	8.3	7.7	7.3	6.9	6.5
8.0	12.16	17.3	15.2	13.5	12.1	11.0	10.1	9.3	8.6	8.1	7.6	7.1	6.7	6.4
7.8	11.85	16.9	14.8	13.1	11.8	10.7	9.8	9.1	8.4	7.9	7.4	6.9	6.5	6.2
7.6	11.55	16.5	14.4	12.8	11.5	10.5	9.6	8.8	8.2	7.7	7.2	6.7	6.4	6.0
7.4	11.25	16.0	14.0	12.5	11.2	10.2	9.3	8.6	8.0	7.5	7.0	6.6	6.2	5.9
7.2	10.94	15.6	13.6	12.1	10.9	9.9	9.1	8.4	7.8	7.2	6.8	6.4	6.0	5.7
7.0	10.64	15.2	13.3	11.7	10.6	9.6	8.8	8.0	7.6	7.0	6.6	6.2	5.8	5.6
6.8	10.33	14.7	12.9	11.4	10.3	9.3	8.6	7.9	7.3	6.8	6.4	6.0	5.7	5.4
6.6	10.03	14.3	12.5	11.1	10.0	9.1	8.3	7.7	7.1	6.6	6.2	5.9	5.5	5.2
6.4	9.73	13.9	12.1	10.8	9.7	8.8	8.1	7.4	6.9	6.4	6.0	5.7	5.4	5.1
6.2	9.42	13.4	11.7	10.4	9.4	8.5	7.8	7.2	6.7	6.2	5.8	5.5	5.2	4.9
6.0	9.12	13.0	11.4	10.1	9.1	8.2	7.6	7.0	6.5	6.0	5.7	5.3	5.0	4.8
5.8	8.81	12.5	11.0	9.7	8.8	8.0	7.3	6.7	6.2	5.8	5.5	5.1	4.8	4.6
5.6	8.51	12.1	10.6	9.4	8.5	7.7	7.0	6.5	6.0	5.6	5.3	5.0	4.7	4.4
5.4	8.20	11.7	10.2	9.1	8.2	7.4	6.8	6.3	5.8	5.4	5.1	4.8	4.5	4.3
5.2	7.90	11.2	9.8	8.7	7.9	7.1	6.5	6.0	5.6	5.2	4.9	4.6	4.3	4.1
5.0	7.60	10.8	9.5	8.4	7.6	6.9	6.3	5.8	5.4	5.0	4.7	4.4	4.2	4.0
4.8	7.29	10.4	9.1	8.1	7.2	6.6	6.0	5.6	5.2	4.8	4.5	4.3	4.0	3.8
4.6	6.99	9.9	8.7	7.7	6.9	6.3	5.8	5.3	4.9	4.6	4.3	4.1	3.8	3.6
4.4	6.69	9.5	8.3	7.4	6.6	6.0	5.5	5.1	4.7	4.4	4.1	3.9	3.7	3.5
4.2	6.38	9.1	7.9	7.0	6.3	5.8	5.3	4.9	4.5	4.2	3.9	3.7	3.5	3.3
4.0	6.08	8.6	7.6	6.7	6.0	5.5	5.0	4.6	4.3	4.0	3.8	3.5	3.3	3.2
3.8	5.77	8.2	7.2	6.4	5.7	5.2	4.8	4.4	4.1	3.8	3.6	3.3	3.2	3.0
3.6	5.47	7.8	6.8	6.0	5.4	4.9	4.5	4.2	3.9	3.6	3.4	3.2	3.0	2.8
3.4	5.16	7.3	6.4	5.7	5.1	4.6	4.3	3.9	3.6	3.4	3.2	3.0	2.8	2.7
3.2	4.86	6.9	6.0	5.4	4.8	4.4	4.0	3.7	3.4	3.2	3.0	2.8	2.7	2.5
3.0	4.56	6.5	5.7	5.0	4.5	4.1	3.8	3.5	3.2	3.0	2.8	2.6	2.5	2.4

3, 3½ and 4 gals. respectively. Let's take a look at the least favorable of these tables which is the 3 gals. per day one. On an 80 lbs. per month propane consumption basis we break even at 7.5-cent propane with oil at 6.6 cents per gal. If we go to 100 lbs. of propane monthly consumption at the same price per pound we still break even with oil at approximately 8.3 cents per gal.! Where are these vaunted terrors of the range oil burner to the propane merchandiser? They must exist only in his mind, or in his ignorance of what it is possible to do with his own product. (Table 9 shows figures for 5 gals. daily.)

When consumption of oil reaches 4 gals. per day for these same two purposes the balance is tipped farther in favor of propane. Oil prices must dip deeper into the cellar to be competitive. Witness that we can furnish 120 lbs. of propane at 7.5 cents per lb. on a break-even basis with oil at 7.4 cents per gal., and we haven't yet said a word about the skeletons which rattle within the range oil burner's closet. Be patient, we shall not forget them!

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(Part 2 of Chapter 19 of The Bottled Gas Manual will be published in the June issue of BUTANE-PROPANE *News. It will contain the Questions and Answers for the entire chapter.—Editor.)*

Special Meeting Southern Section

K. H. KOACH, chairman of the Southern Section, Liquefied Petroleum Gas Association, has called a special meeting of the Southern Section for April 30 and May 1. The place is Atlanta, Ga., at the Henry Grady hotel. The convening hour is 10 a. m.

K. H. KOACH

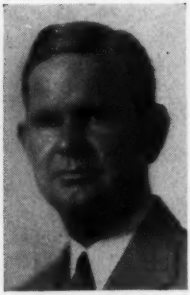
It is expected that Paul K. Thompson, chief of the Liquefied Petroleum Gas Equipment Unit of the War Production Board, will be present to address members on existing government orders as they affect the LP-Gas industry, and it is possible that representatives of the Petroleum Administration for War and the ODT may attend, also. In addition, there will be several members of the Industry Advisory Committee and Louis Abramson, Jr., president of the LPGA.

The meeting will be devoted to discussions of current problems, as involved in the war effort, and will afford dealers and operators an opportunity to present their individual problems for authoritative answers.

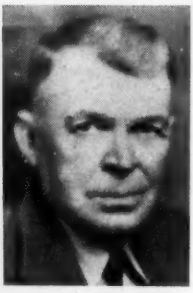
Mr. Koach urges all members to attend and, if possible, to notify him of their intentions in advance. His address is Green's Fuel, Inc., Sarasota, Fla. Hotel reservations should be made by wire to W. S. Christopher, Georgia Automatic Gas Co., 600 Peachtree St., Atlanta, Ga.

War Products and Processes Are NGAA Convention Themes

R. E. MILLER



J. W. VAIDEN



F. P. PETERSON

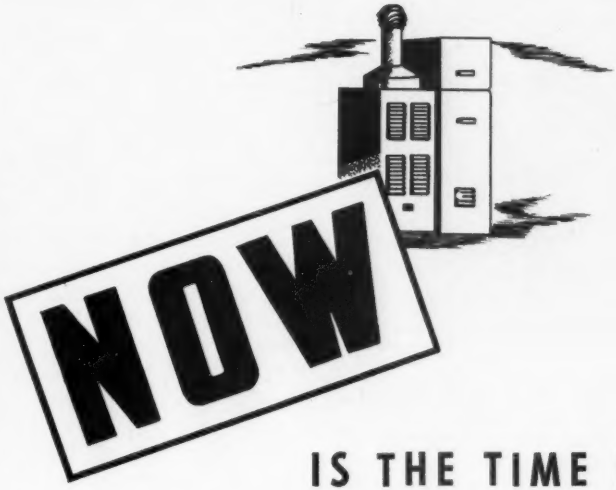
H. H. BEESON

JAMES W. Vaiden, of the Skelly Oil Co., Tulsa, Okla., is the new president of the Natural Gasoline Association of America, elected at the 22nd annual convention in Dallas, Texas, April 14-16, a meeting which had for its principal theme discussions of war products and processes. Mr. Vaiden was vice president last year, and succeeds Ray E. Miller, of Hanlon-Buchanan, Inc.

The vice presidents for the ensuing term are H. H. Beeson, Sabine Valley Gasoline Co., Inc., Shreveport, La.; H. A. Ells, Cities Service Oil Co., Bartlesville, Okla., and R. A. Carter, Continental Oil Co., Ponca City, Okla. C. R. Williams, The Chicago Corp., Corpus Christi, Texas will be the new vice-president of the High Pressure Gas Division this year. Wm. F. Lowe will again serve as secretary-treasurer. Thirteen member companies were elected to serve a two-year term as directors with 13 other companies which hold over from last year's election.

The Hanlon Award, top prize of the natural gasoline industry for meritorious accomplishment among its members, and for a number of years a feature of the annual NGAA conventions, was presented to Franklin P. Peterson, declared to be "the father of the liquefied petroleum gas branch of the natural gasoline industry."

From 1907, when he began his first experiments with small gas engines, through the first patent for "liquefaction of natural gas by pressure fractionation," obtained by him in 1911, up to his recent retirement after many years with the Mid-Continent Petroleum Corp. of Oklahoma, Mr. Peterson has contributed outstandingly to the development of the liquefied petro-



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leum gas and natural gasoline industries.

The social part of the program consisted of a cocktail hour and buffet dinner, with the Natural Gasoline Supply Men's Association acting as host.

The first day's session heard the report of the Technical Committee, of which H. H. Beeson is chairman, and for which H. A. Montgomery read a report on the "Low Temperature Fractional Analysis Project"; the report of the High Pressure Gas Division on field tests to determine standard methods of sampling and obtaining specific gravity of two-phase gases by W. L. Bowser and D. A. Sillers, and the following papers: "Corrosion in Distillate Wells," by T. S. Bacon and E. A. Brown; "Fractional Analysis by the Mass Spectrometer," by Dr. O. L. Roberts; and "Developments in Analysis of Hydrocarbon Gases by Means of Absorption Fractionation," by N. C. Turner.

The Technical Session occurred April 15, with the following papers: "Tepetate, Six Years Later," by E. O. Bennett and F. B. Haverfield; "The Potentialities of Alkylation and Isomerization," by Arch L. Foster; "The Distillate Industry in the War Program," by J. R. Butler; "Intelligent Use of Natural Resources," by Ray E. Miller; "Normal Butane," by R. C. Alden; "Post-War Possibilities of Natural Gas and Natural Gasoline," by P. M. Raigorodsky and Dr. Frank Dotterweich, and "The Roll of Natural Gasoline in the 100-Octane Gasoline Program," by Bruce K. Brown.

An "Information Please" type of forum was presented April 16 at which attending technical men and executives had the opportunity of questioning leading authorities on processing trends with a view to obtaining guidance for their present and future operations. There was a panel of 15 experts consisting of A. J. L. Hutchinson, R. P. Mase, M. F. Kotzebue, Dr. E. R. Newton, M. M. Perkins, Dr. E. R. Smoley, A E. Buell, N. K. Rector, Henry Wade, Louis Weiss, M. C. Keith, A. V. Bourque, Justin Wolf, E. Holley Poe, Paul M. Raigorodsky and James E. Pew. The interlocutor was D. E. Buchanan, who was assisted by C. R. Williams, J. W. Vaiden and B. R. Carney.

The convention program committee was composed of James W. Vaiden, John B. Atkins, Paul C. Coffin, H. E. Felt, O. L. Roberts, Harry Wheeldon and C. R. Williams.

CALENDAR

Southern Section, LPGA — Henry Grady Hotel, Atlanta, Ga., April 30-May 1.

LP-Gas Industry Advisory Committee of War Production Board — Washington, D. C., May 3.

Midwest Section, LPGA—The Palmer House, Chicago, May 13-14.

Pacific Coast Section, LPGA—St. Francis Hotel, San Francisco, May 28.

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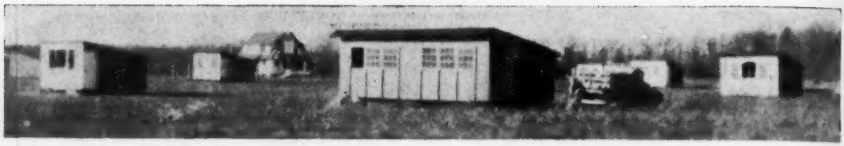


Gas Brooding Builds Load

BUILDING a propane gas load by selling farmers chicken brooders was begun four years ago by the Suburban Gas Co., Livingston, N. J., according to S. J. McLagan, operating manager.

S. J. McLAGAN

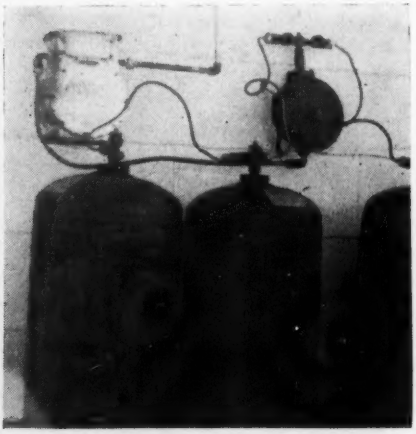
As it was an innovation in that locality, 10 brooder stoves, made by the A. R. Wood Manufacturing Co., were put out among as many farmers as demonstrators without charge, except for the actual gas used. This made possible accurate cost comparisons with other fuels, acquainted users with the efficiency of LP-Gas, and formed the basis of the large volume of business.

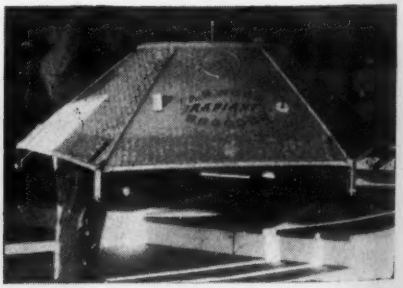
Principal difficulties encountered: Farmers frequently move brooder houses to new fields to reduce pest and disease problems, causing need for new connections and gas line changes; brooders are piled in the fields in summer, often necessitating expensive repairs due to careless handling; dust raised by chicks compels frequent cleaning of orifice and burner throats, and periodical gas and air adjustments on burners are needed, all of which apply to other fuels as well as to LP-Gas. One hazard to the dealer, warns Mr. McLagen, is in establishing too low a gas rate for brooding to cover these costs and still leave a profit.

TOP: The type of brooder houses that are moved frequently from field to field.

BELOW (left): Ten brooders are fed from one bank of eight cylinders.

BELOW (right): Clyde Hopkins makes final connection to complete brooder installation.





DALLAS TANK & WELDING COMPANY, INC.

BUTANE DIGEST

By W. W. BANKS

Our thanks to Bastian-Blessing for the fine pictures in their double page ad, April issue B-P News, which pictured part of the 11 carloads of our tanks sent to National Butane Company. These tanks, designed for essential war service in Government Housing Projects, ranged from 215 to 1,000 gallons capacity.

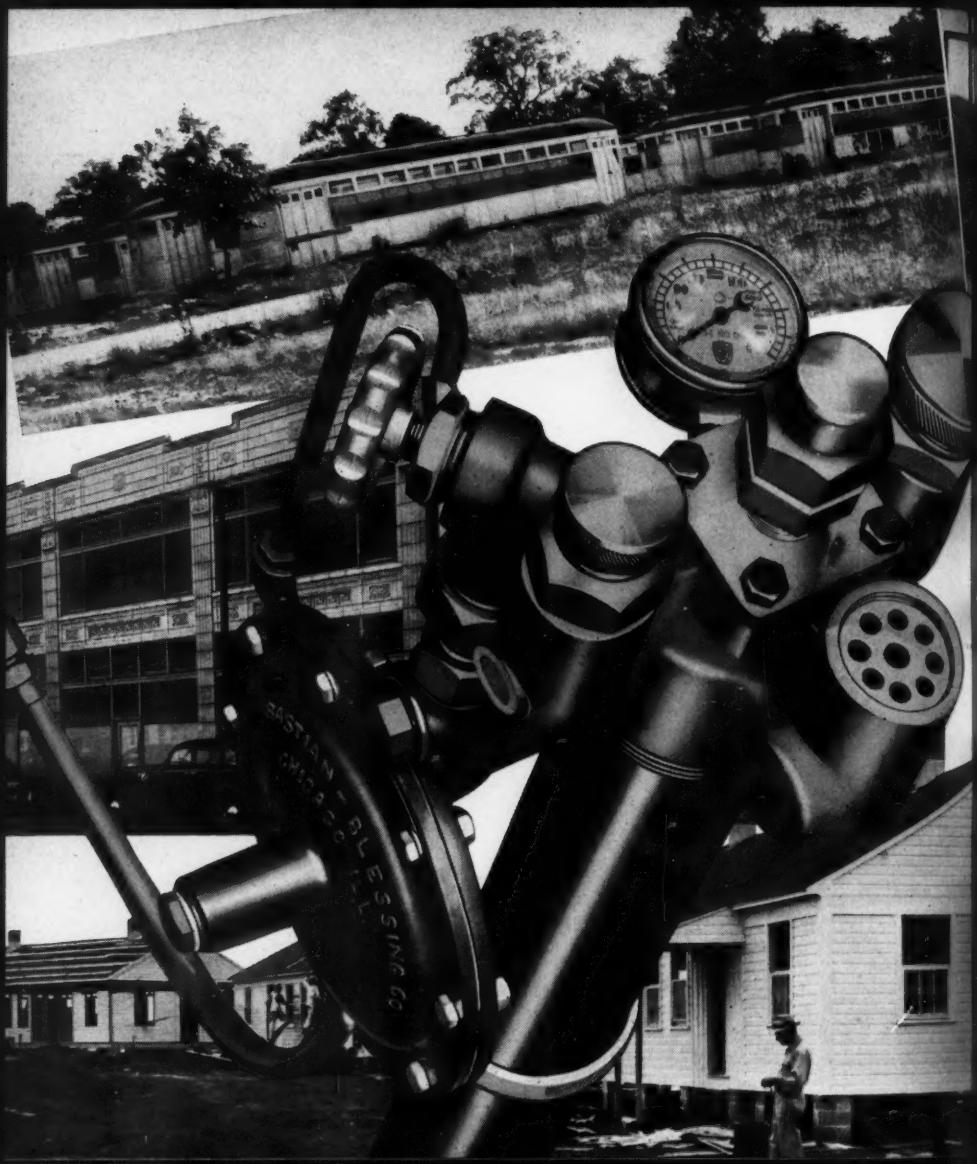
•

Yes, we are extremely busy these days with fabrications to help speed up war production and lead to victory. Ways and means for doing a still bigger job are problems that daily confront us. Our fourth and most recent major building project greatly increases our facilities, but we find as facilities are added the needs increase, too.

•

We have strengthened our engineering and production forces and will be glad to have our engineers cooperate with your engineers in finding solutions to future and post-war problems of the L-P Gas Industry. We believe that post-war planning for the industry is not only sound, but patriotic. We believe that now is the time to start thinking about the problems which will confront us. We're looking ahead because we feel the future of the L-P Gas Industry is brilliant and worth thinking about, and as we have said before in this column, we haven't scratched the surface yet!

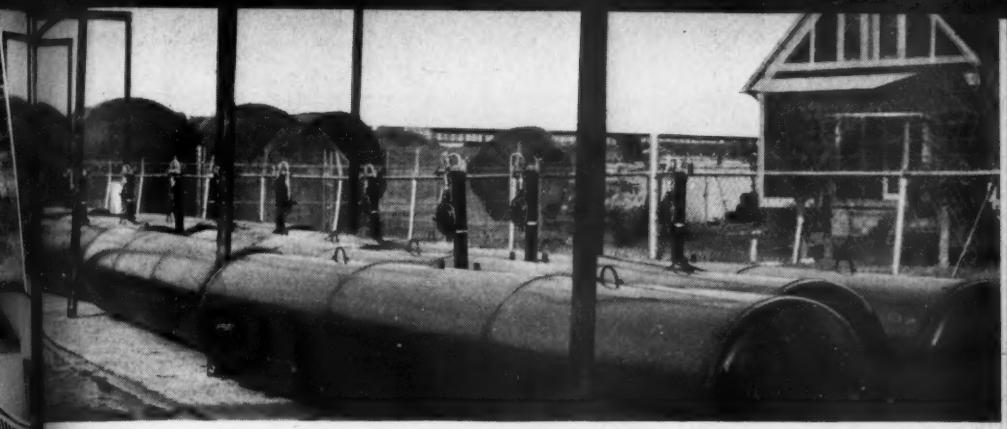
DALLAS TANK
AND
WELDING COMPANY, INC.
201-5 W. COMMERCE ST. DALLAS, TEXAS



REGO

LP GAS EQUIPMENT

BUY WAR BONDS FOR VICTORY



WINNING THE WAR with *LP Gas* and REGO

Rego equipment is helping to win the war in many applications of LP Gases to heating and cooking in Government Housing Projects, Industrial Processes, Camps, Air Fields, War Plants, Shipyards, etc. These gases are recognized as a clean, quick and efficient fuel which helps to conserve other fuels that are critical. With Rego equipment alert dealers are handling LP Gases dependably, safely and economically in diverse applications that are meeting today's most urgent war needs.

Photos Courtesy Rego Distributors W. G. Petty & Son, Automatic Gas Co., Dallas Tank & Welding Co., and National Butane Co.

Insure perfect performance and economy by insisting on genuine Bastian-Blessing products identified by the RegO trademark.

The BASTIAN-BLESSING Co.
4233 Peterson Avenue Chicago, Ill.

Pioneers in equipment for using and controlling high pressure gases.

REGO LP GAS EQUIPMENT

UL

Need ENGINEERING assistance?

When time is of the essence, why struggle with problems involving heat applications, when there is a trained and fully staffed engineering force who are specialists in this field. ☆ These men are thoroughly conversant with all commercial and industrial applications of heat . . . whether it be space heating, drying, cooking, burning, baking, material heating. It makes little difference whether you need a small hand torch or the complete design and erection of a Butane power or standby plant—our engineers are ready to serve you with production equipment when possible, and with special designs when necessary. ☆ Your inquiries are invited.

RANSOME COMPANY

Designing and Constructing Engineers

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Ransome

RESEARCH

• **EACH MONTH a competent staff reviews more than 70 publications serving the oil, gas and affiliated industries in a search for those published articles of value to technicians and executives in the liquefied petroleum gas industry. In this department of** BUTANE-PROPANE *News*, **brief abstracts of such articles are presented.—Editor.**

War Needs Bring Many Changes in Processing—C. R. Wagner. *Oil and Gas Journal*, March 25, 1943. Page 82. The two subjects claiming most attention during the past year and today are aviation gasoline and synthetic rubber. The early practice of announcing the goal for aviation-gasoline production was discontinued about the time that the man on the street began to wonder how much was 150,000 bbl. per day. What is present production and what is the present goal are questions that may be answered after the war. The thinking petroleum refiner is impressed, however, by a forecast production of 100-octane motor fuel which equals or exceeds the previous production of Ethyl gasoline. The effect of such a situation in the post-war period upon transportation is certain to be profound.

100-Octane Aviation Gasoline Processes Show Rapid Advance—C. C. Pryor, *Petroleum Engineer*, March, 1943, Page 61, Part 1. The tremendous progress in the development of aircraft engines to the modern power plant of today's airplane is due largely to the availability of high-octane fuels—fuels that have been created in the laboratories of the oil industry by intensive research. Octane is defined as any of a group of eight carbon atom isomeric hydrocarbons of the paraffin series. The term "octane rating" is an arbitrary rating of a fuel that indicates its anti-knock qualities relative to an arbitrary standard. As the octane rating of a gasoline is increased, the power it will deliver is increased, and it may be used with a greater efficiency.

Combustion Safeguards in the Utilization of Gaseous Fuels—Theodore A. Cohen, *G A S*, March, 1943, Page 23. Marked advances in development of equipment to eliminate explosions have been made in recent years, extending applications of modern combustion safeguard instruments to all types of direct-fired boilers, industrial furnaces and ovens. Article details explosions in starting, prevention of explosions, importance of purging, flame as a conductor of electricity and the protection extended to instrument failure.

Industrial Fire Brigades Training Manual—This 184 page volume, recently published by the National Fire Protection Association, is designed to meet three wide-spread demands: First, as a training manual for employees assigned to carry out fire fighting duties under direction of the chief of the private brigade; second, as a reference book in those plants where a large group of experts can be profitably utilized; and third, in those plants which need the essentials but not the details of large plant fire protection organizations. The

text was prepared by the N.F.P.A. Committee on Firemen's Training, a group of leading fire chiefs and fire protection experts. It is profusely illustrated with drawings and photographs. Page size 8½x11 in. Single copies $1.50 postpaid from the National Fire Protection Association, 60 Batterymarch St., Boston, Mass.

New Processes Require More Powerful Automatic-Control Equipment—J. B. McMahon, *Oil and Gas Journal*, March 25, 1943, Page 90. New catalytic cracking alkylation and other processes require control equipment capable of moving valves and other regulators against considerable resistances. Automatic control under these conditions for steam-making and similar operations has been fairly well worked out. The equipment used for these purposes may be adapted to the new refinery processes. This article shows the principle of these control systems and why they perform the job better.

An Analysis of Heating Industrial Buildings With Gas.—Bulletin of the A.G.A. Committee on Industrial Space Heating, James E. Dare, chairman. The six major objectives as analyzed in this bulletin indicate that: (1) This load is very desirable and of permanent nature. (2) It is an aid in the war production program, especially in areas where no gas limitation orders apply. (3) There is a present tremendous demand for this type of load. (4) There will be a large future market for this type of load. (5) To obtain this load a careful analysis of the competitive conditions affecting sales must be made. (6) Conservation of critical metals can be attained through the installation of gas fired unit heaters instead of competitive fuel equipment. The data, illustrations, suggestions, recommendations and general information contained is submitted for the purpose of aiding the gas industry in obtaining its proper share of the industrial space heating load.

Synthetic Rubber Development Smoothing Out Some Serious Problems—Arch L. Foster, *Oil and Gas Journal*, March 25, 1943, Page 87. While the rubber output originally planned for 1943 has been reduced to make way for more critical production, the present schedule is expected to take care of imperative needs with a small margin at the year's end. Long range research is secondary to immediate requirements.

Oil and gas operating regulations applicable to lands of the United States and all restricted tribal and allotted Indian lands (except Osage Indian Reservation). [1942.] [iv], 21 pp. (Code of Federal Regulations, Title 30, Mineral Resources, Chapter II, Geological Survey, Part 221.) [Processed.] *Free on application to the Director, Geological Survey, Washington, D. C.*

Some Uses of Infra-Red Spectroscopy for Hydrocarbon Analysis.—R. Robert Brattian, *Petroleum World*, Feb. 1943, Page 46. Through construction of special equipment these methods have been reduced to routine procedures which can be carried out by comparatively inexperienced operators.

How to Double Your Heat-Exchanger Surface—W. L. Nelson. *Oil and Gas Journal*, Jan. 14, 1943, Page 34. Today heat exchangers are vital to our war effort. Described here is a method by which exchangers already in service can be made to meet our needs, and at no great sacrifice in heat economy.

Women Won't Forget This Tappan Picture!

. . . because right now 15,300,000 Americans are reading about that Tappan in their favorite magazines! In LIFE, WOMAN'S HOME COMPANION, LADIES' HOME JOURNAL and McCALL'S, we are continuing to tell them over and over again about the merits and advantages of Tappan Ranges — now giving such splendid satisfaction to owners — and which you will again be able to offer at end of war.

Write about the possibilities of a Tappan Post-War Dealer franchise

AND AS FOR THE PRESENT . . . through this same national advertising:

We're offering the new Tappan "Owner Service Book". . . which they can obtain at Tappan Dealers.

We urge your cooperation in having prospects acquire War Bonds and "earmarking" them for future Tappan purchases.

TAPPAN *Ranges*

THE TAPPAN STOVE COMPANY, MANSFIELD, OHIO

Truck and trailer, carrying five spherical transport tanks, which will haul fuel from Los Angeles to Arizona

Will Haul Butane To Arizona

THE Butane Corp., Phoenix, Ariz., took delivery in April of five new spherical butane transport tanks, mounted on truck and trailer, that will enable the company to meet its need for fuel without depending upon rail transportation from Los Angeles.

Every sphere has a gross capacity of 1943 gals.; net, 1750 gals. The working pressure is 139 lbs. and outside diameters are 96 in. All fittings are recessed in the semi-elliptical heads, with recessed rotary gages on the sides and discharge openings in the bottoms. All openings, except the pressure gage, relief valve and filler valve, are equipped with excess flow checks. The tanks are constructed of 5/16-in. flange steel, and the segments are "dished out" hot in a hydraulic press to relieve stress.

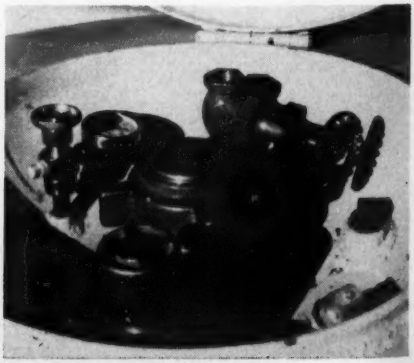
The design of these spheres is such that they can withstand the same pressure as the more conventional, cylindrical tanks whose plates are 5/8-in. in thickness, according to W. T. Joplin, president of Butane Corp., and thus he will be able to transport 8500 gals. of fuel per trip as against 6200 gals. in the other type, due to the difference in the weight of steel.

These new spherical tanks are the result of collaboration between Mr. Joplin and Ralph E. Beisner, sales manager of Superior Tank and Construction Co., Los Angeles, whose company manufactured them. R. L. Fowler, of the same company, was the chief engineer.

Merco Nordstrom shut-off valves are used and the fittings were provided by L. C. Roney, Inc., Los Angeles.

▲

The fittings for the spherical tanks are in the recessed heads to protect against injury.



"I'm selling goodwill now when I can't sell the goods. I'm giving my customers service—keeping them enthusiastic about their present L-P Gas appliances. Then when peace comes and they're ready to buy, I'll have my prospects *half* sold.

"Creating goodwill for L-P Gas and equipment is pretty easy in most cases. When I make a gas delivery I ask about their appliances. Everything is usually in good working order, but because I keep in touch with these customers, they know I'm ready to back the equipment I've sold them.

• • •

"SATISFIED CUSTOMERS TODAY . . . MEAN MORE PROSPECTS TOMORROW"

FREE L-P REFRIGERATOR SERVICE MANUAL—Write today for your free copy to Servel, Inc., Evansville, Ind.

SERVEL,
Incorporated

PEACETIME MAKER OF THE SERVEL GAS REFRIGERATOR

ENSIGN

BUTANE-PROPANE CARBURETORS

Working for Victory

ENSIGN Butane-Propane Carburetors are playing an important part in the Victory effort. We are proud of this fact and are devoting our modern facilities and long experience to the successful completion of this assignment. Helping to win the war is our chief duty at this time.

But still available

ON THE HOME FRONT

However, ENSIGN Carburetors for Butane-Propane and Gasoline are still available for uses not directly connected with the war effort. It may take us a little longer than usual to supply the demand for carburetors, but quick delivery of emergency parts is assured. Now, as always, ENSIGN is unequaled for efficient and economical carburetion.

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Before ordering ENSIGN Butane-Propane Carburetion Equipment or Parts, read W.P.B. General Limitation Order L-86. Copies can be obtained from your nearest W.P.B. office.

BUTANE Power

Iron Ore Trucks, Using LP-Gas, Bring Big Savings Over Diesel

By HAROLD W. SMITH

President, American Liquid Gas Corporation, Los Angeles.

ONE man told another, and soon the story of the remarkable performance of mining equipment converted to liquefied petroleum gas operation was being widely discussed throughout the Great Lakes region mining country. And now that remarkable story has been given an academic stamp of approval with its presentation in documented form at the University of Minnesota symposium for mine operators.

The story concerned a "test-tube" experiment seeking to determine what, if any, advantages would accrue by switching from diesel fuel to liquefied petroleum gas operation. The laboratory was the Sagamore Iron Mine at Riverton, Minn., and the experimental material consisted of five Dart trucks equipped with WAK Waukesha engines and Algas carburetors and converters. The fuel was Phillips' "Superfuel." The results of the experiment conclusively demonstrated that liquefied petroleum gas operation was more economical and more dependable. Most important at a time when new trucking equipment is almost impossible to get—LP-Gas operated trucks required fewer repairs and stayed on the job day after day, doing more work per unit, than diesel operated trucks.

As related by G. H. Bach at the symposium, the experiments covered the time when the five large mine trucks were placed in service in April, 1941, up to Jan. 1, 1943. During this period the five LP-Gas-powered trucks hauled a total tonnage of 2,100,000 tons in 35,670 hours of operation, according to Palmer Gray, superintendent of the Sagamore mine.

"Figures on our butane operation reveal that our engine repair cost totaled $1313.50," stated Mr. Gray. "Our repair cost per ton was $.0006, and the repair cost per hour was $.037. This figure includes all labor and material consisting of piston rings, spark

plugs, carbuetors and engine gaskets. It also includes allied equipment such as Bendix and starters, generators, pumps, temperature gages, distributor parts and fan belts.

"The engines have been inspected regularly and at the present time have approximately 8000 hours of operation each. From recent inspections we do not feel that a major overhaul is necessary," Mr. Gray emphasized before the mine operators. "Our schedule on oil changes is 800 hours on butane, and at other properties on diesel engines our oil changes are scheduled at 79 hours. One quart of oil is the maximum added per 24-hour period."

Corroborating this report was O. P. Sather, lubrication engineer of the Standard Oil Co. of Indiana. He declared that, whereas oil on Hesselman truck engines used to be changed every 80 hours, mine trucks now are drained at the end of an 800-hour period and have even been run in excess of 1000 hours.

▲

Liquefied petroleum gases now are being used as fuel in a number of iron mines. Pictured here is a drag-line bucket for loading huge 15-ton butane - powered trucks as shown on Page 48.

▼

Seasoning the Axis Stew

While our boys at the front are cooking up a "stew" for the Axis, we're busy right now with the seasoning. Here at Robertshaw we've turned from thermostats to such condiments of warfare as fuses for hand grenades, primers and ignition cartridges for rockets, and boosters and shells for the Army and Navy aircraft and anti-aircraft guns.

Furthermore, we're now drawing on our years of experience in thermostat development and manufacture to guide us in the rapid production of precision instruments for aircraft.

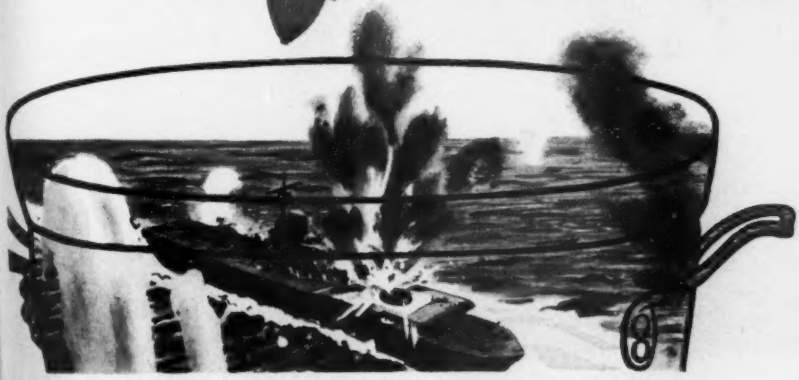
And as our Government still needs Robertshaw thermostats for official projects, we're still turning out a limited quantity for that purpose — just enough to keep our engineering and research departments busy in working out new and better models for the new and better days when the boys come home.

For High Achievement in the production of war equipment

ARMY E NAVY

ROBERTSHAW

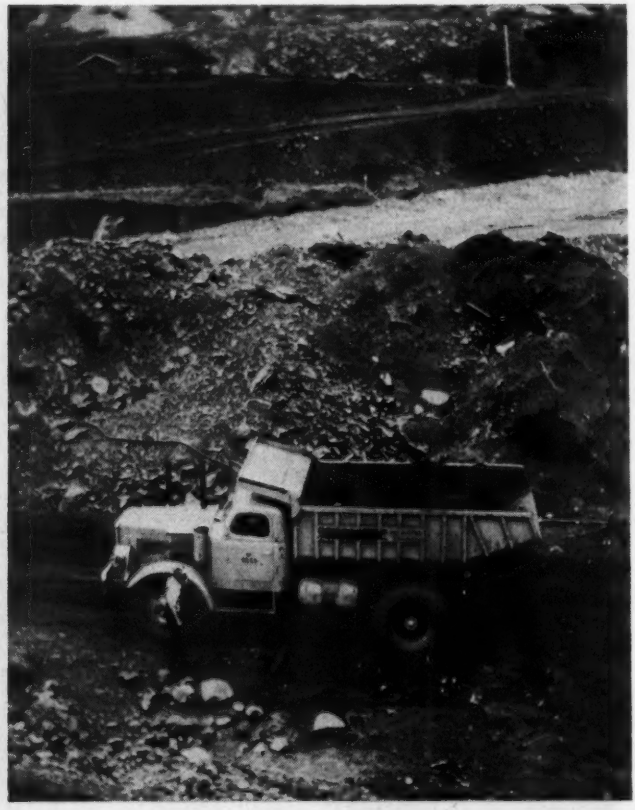
ROBERTSHAW THERMOSTAT CO., YOUNGWOOD, PA.



As a result of this test of the relative merits of LP-Gas and diesel operation, the operators of the Sagamore mine have decided to convert all trucks at all their properties. The Bennett mine at Hibbing, Minn., began its operation in May of 1942. To date they have experienced no engine maintenance costs other than preventative. Since November, Phillips Petroleum Co. engineers have been installing bulk storage equipment at Mahnomen, the Biwabik, the Corsica and the Alvany properties. All trucks started operating on butane April 1.

Other operators throughout the mining area are joining the swing to converting diesel equipment to LP-Gas. The movement has been given impetus by the necessity of keeping truck and tractor units on the job, the shortage of highly trained diesel repair men, the growing scarcity of parts, and the mounting expense of maintenance.

Many mines have been using gasoline-powered equipment, and they, too, are finding that with the



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Each of two such trucks as the one shown here hauls 60 tons of iron ore per hour from mine to railroad car. This truck and the shovel on Page 46 are in the surface iron ore mines of northern Michigan and use Algas carburetors.

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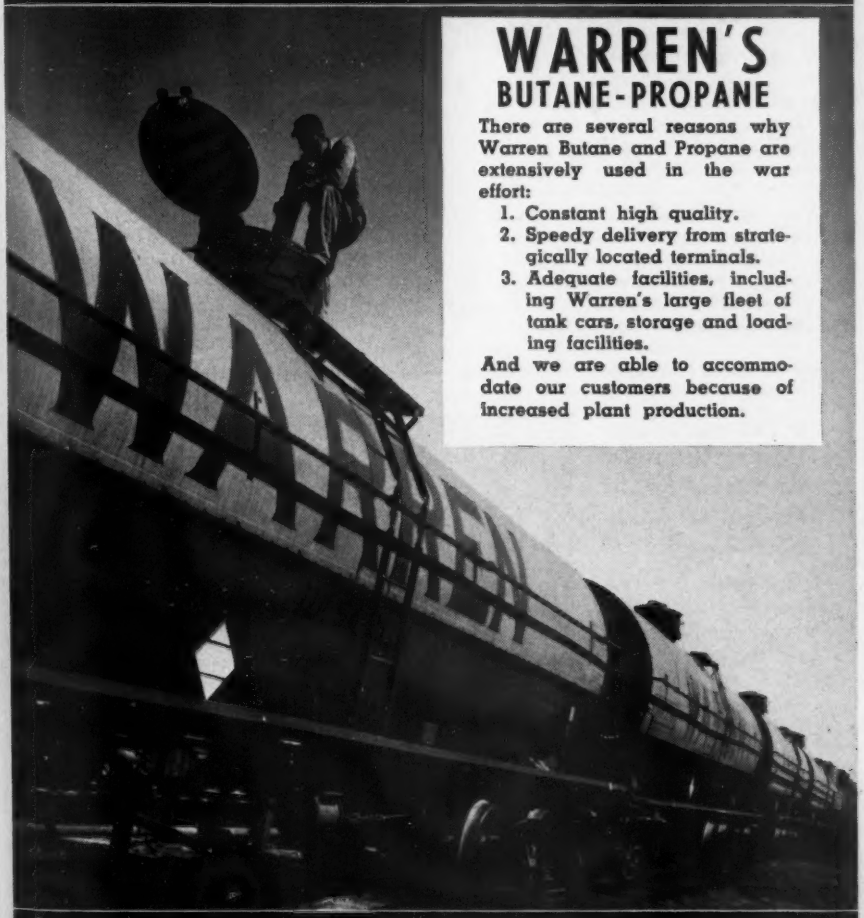
WARREN
LIQUEFIED PETROLEUM GAS



WARREN'S
BUTANE-PROPANE

There are several reasons why Warren Butane and Propane are extensively used in the war effort:

1. Constant high quality.
2. Speedy delivery from strategically located terminals.
3. Adequate facilities, including Warren's large fleet of tank cars, storage and loading facilities.

And we are able to accommodate our customers because of increased plant production.

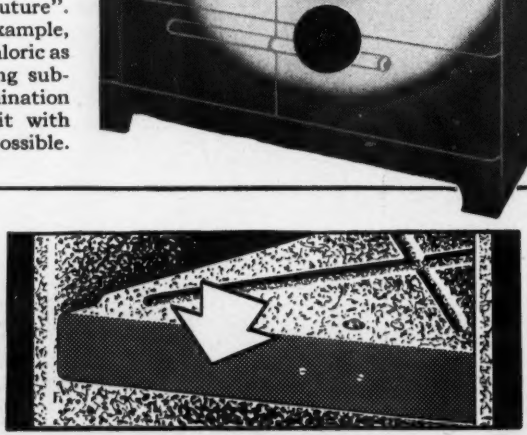
WARREN PETROLEUM CORPORATION
Tulsa, Oklahoma

Research

LIGHT

Even as our plant continues all-out on war equipment, the research light in the hands and minds of Caloric engineers and designers is focusing upon ideas, materials and designs for the Caloric "Range of the Future". The feature below, for example, which helped establish Caloric as finest in its field, is being subjected to merciless examination to improve or replace it with something even better, if possible.

● This was an outstanding feature of the last Caloric off the lines before all-out war production



The arrow indicates where a cross-piece, a part of the frame, separates oven and grill at the front of many ordinary ranges. Exposed to intense heat, it is one of the first parts to fail and replacement is a costly, laborious job. Caloric contained no such cross-piece. The overhanging curtain of the oven bottom itself—easily replaceable if necessary—took the place of the cross-piece.

Our research light will continue to probe for a finer Caloric to heighten your post-war sales and brighten your customers' kitchens

CALORIC
GAS RANGES

CALORIC GAS STOVE WORKS
PHILADELPHIA, PA.

trends to larger units, greater horse power, and higher compression engines, liquefied petroleum gas is the answer to their problems. The octane value of this fuel is in the neighborhood of 100, as compared with 60 or 70 for gasoline. This high rating permits the use of high compression without detonation, resulting in a marked increase in horse-power. This increase may be conservatively estimated at 15%, although many operators have reported horse power increases of 20% to 25%.

The second important reason mine operators have turned from gasoline to LP-Gas is better lubrication and lower oil cost.

Gasoline is a blend of many hydrocarbons. Some are light and volatile while others are heavy and not so volatile. This variation creates a tendency for the heavy ends in the fuel charge to drop out and puddle in the manifold. If the truck is traveling up hill, these ends will run into the back cylinders. The result is the loss of power, carbon formation, and oil dilution for those cylinders at the rear of the engine. When going down hill, the same is true of the forward cylinders.

This also gives an uneven power output from the various cylinders, causing vibration and strain throughout the equipment on the motor, clutch, transmission, differential, bearings, and even tires. This leads us to the third important reason mine operators are converting to LP-Gas—the natural characteristics of the fuel which remind one of steam in their action. Combustion is slow, resulting in a steady push on the piston. Thus LP-Gas gets away

One of the Sagamore Mining Co.'s heavy duty trucks, converted to burn LP-Gas, which is used in Minnesota iron mines. It is capable of hauling 18 tons of ore up a 10% grade in third gear.

from the high initial power shock that occurs with gasoline when the piston nears the top of its stroke. This shock on the piston and rod when directly above the crank must be absorbed by the bearing, crank shaft and other parts. It results in strain and vibration throughout the power plant, whereas with LP-Gas the flow of power is smooth like that obtained by expanding steam.

To summarize, when gasoline is used it will tend to produce factors requiring comparatively frequent repairing and overhauling of the equipment. When LP-Gas is used, more power, less wear, less overhauling and greater engine life may be expected.

And while LP-Gas is playing an important part in the war effort through aiding mine operators to produce ore in greater quantities with maximum use of present equipment, an even greater role awaits the industry when the peace finally has been won. Priorities will have been abolished and many more units will be enabled to switch from gasoline or diesel operation to liquefied petroleum gas. Engine manufacturers will have introduced liquefied gas engines, many of which are now operating as experimental units in factories. The greater efficiences and lower operating costs made possible by LP-Gas operation will have been adopted industry-wide, and mine operators will be producing more ore at the same speed at a lower cost—or will have the alternative of producing the same amount of ore at faster speeds and at a lower cost.

400,000 Refrigerators To Be Released This Spring

Approximately 400,000 household refrigerators—almost half of them electric or gas-operated and the other half non-mechanical "ice boxes"—will be available to the general public this spring, the WPB Consumers Durable Goods Division announced April 6. Most of the refrigerators released will be six, seven, or eight cubic feet capacity, deluxe models.

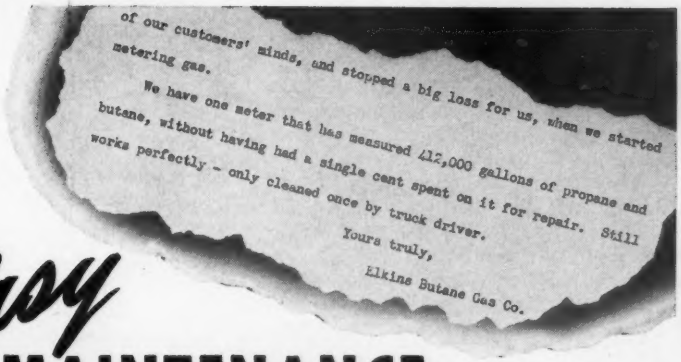
Only those who cannot be served by other types of refrigeration are eligible to buy gas or electric refrigerators, and each purchaser must attest, on a Government form supplied by his retailer, that "the domestic mechanical refrigerator being transferred is required by me. . . . I have no other domestic mechanical refrigerator, nor do I have available any other refrigeration equipment which I can use. . . .'" This form is available to the purchaser, as a part of the sales transaction, from his dealer. It will not be supplied at WPB offices.

◆ ◆

LP-Gas Industry Advisory Committee Meets Again May 3

The 11 members of the liquefied petroleum gas industry who were appointed last month to act in an advisory capacity to the War Production Board (see BUTANE-PROPANE *News*, April, Page 54) will meet again in Washington, D. C. on May 3.

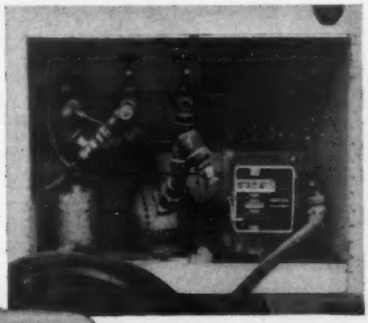
Special problems were submitted to them at the first meeting for investigation and consideration and these will come before the May hearing.

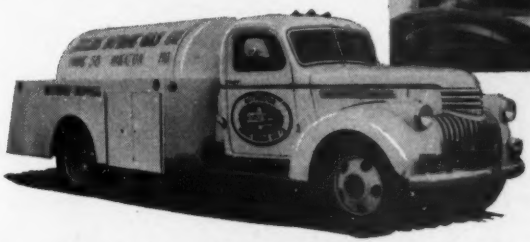

of our customers' minds, and stopped a big loss for us, when we started metering gas.
We have one meter that has measured 412,000 gallons of propane and butane, without having had a single cent spent on it for repair. Still works perfectly - only cleaned once by truck driver.
Yours truly,
Elkins Butane Gas Co.

FOR *Easy* MAINTENANCE...

● Note that it didn't require a regular maintenance man. The *truck driver* for Elkins Butane Gas Company (Wheaton, Mo.) could handle this simple Red Seal cleaning job without any trouble.

RED SEAL LIQUID LP-GAS METERS pretty well take care of themselves. A big, wartime help—especially when manpower is scarce!





Red Seal Print-O-Meter prints ticket showing exact gallonage of each delivery made by Elkins tank truck. No disputes!

NEPTUNE METER COMPANY
Main Office: 50 West 50th Street, New York. Branch offices at Atlanta, Boston, Chicago, Dallas, Denver, Kansas City (Mo.), Los Angeles, Louisville, Philadelphia, Portland (Ore.), San Francisco, and Long Branch, Ont., Canada.

NEPTUNE RED SEAL METERS

2024

NEPTUNE RED SEAL METER CO.

GASOLINE DISPENSING PUMPS • METERS FOR: BARGE AND TANK CAR UNLOADINGS • STORAGE TRANSFERS • LOADING RACKS • DELIVERY TANK TRUCKS

Standard Oil Co. of Calif. Forms Chemical Company

The Standard Oil Co. of California has organized a subsidiary concern which has already begun the manufacture of industrial chemicals. It is the Oronite Chemical Co., and B. G. Smith is president.

The Standard Oil Co. has also announced its intention to build a butadiene plant at El Segundo, Calif. The cost will be more than $6,000,000.

◆ ◆

Preference Rating Order No. P-100 Has Been Revoked

Preference Rating Order P-100, which LP-Gas operators have been entitled to use to obtain needed materials for general repairs, maintenance and operating supplies, was revoked April 5 by the War Production Board.

Producers now operate under CMP Regulation No. 5, which became effective March 31. It automatically assigns an AA-1 preference rating.

◆ ◆

WPB Issues Booklet Explaining CMP

Answers to the most frequently asked questions in connection with the operation of the Controlled Materials Plan have been made available by the War Production Board in booklet form.

These questions and answers have been compiled following field surveys by the staff of the Controlled Materials Plan Division, and represent an aid to industry in operating under CMP Regulations as they stand today.

A copy of the question and answer booklet may be had upon request.

Spherical Tanks for Truck Transport—Built by Superior

BUTANE and PROPANE TANKS
Domestic - Mobile
Truck - Storage
STEEL TANKS
Bolted - Welded
Storage - Pressure

No matter how large . . . or how small . . . your tank requirements may be, we are prepared to serve you in the design and construction of the tanks you need.

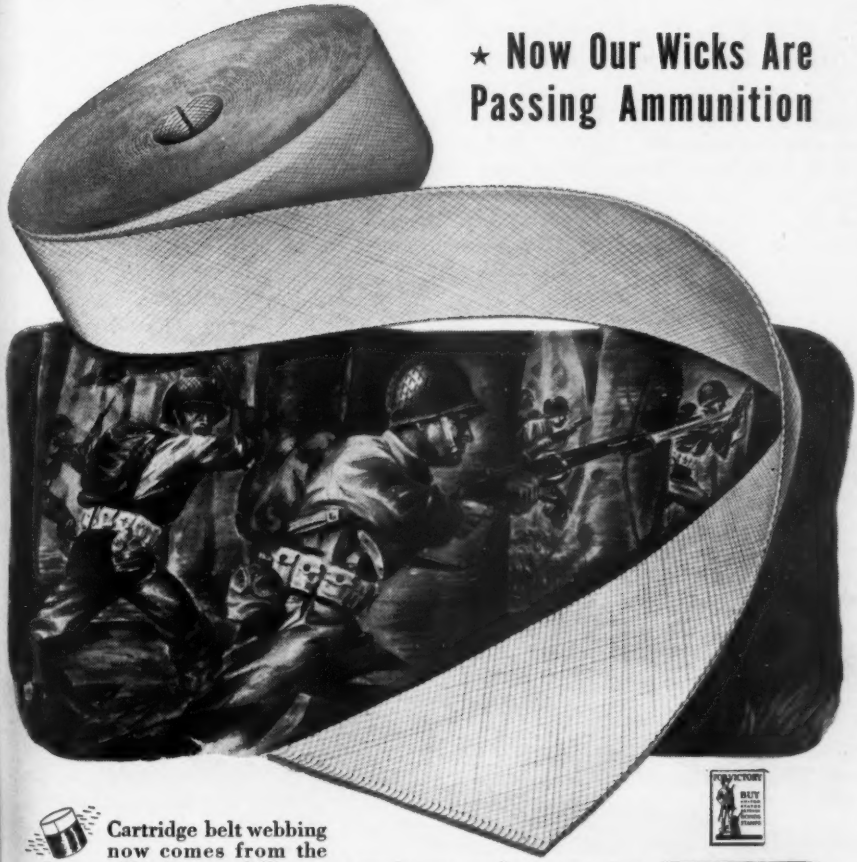
SUPERIOR TANK & CONSTRUCTION CO.

PHONES: AN 4157
NIGHT: CA 4032

6155 SOUTH EASTERN AVE.
LOS ANGELES, CALIFORNIA

A phone call will bring a representative to discuss your needs.

★ Now Our Wicks Are Passing Ammunition



Cartridge belt webbing now comes from the looms of Lindemann & Hoverson. Steel tool boxes for trucks and metal cases for electrical control apparatus have replaced ranges and ovens. Metal containers for bomb parachutes, anti-aircraft shells and machined pins for tank tracks are made to exacting specifications. This pioneer stove manufacturing organization is achieving new precision methods that will be apparent in improved L&H products. In your planning for peace, keep L&H in mind.

A. J. Lindemann & Hoverson Co.

MILWAUKEE • *Since 1875* • WISCONSIN

KEROGAS MANUFACTURERS OF ELECTRIC RANGES . ELECTRIC WATER HEATERS GAS RANGES.. OIL STOVES . PORTABLE OVENS . OIL HEATERS...WICKS ALCAZAR

J. R. Jarvis, Vice President, NGAA, Passed Away March 27

Joseph R. Jarvis, a pioneer in the gasoline industry of the country and a vice president of the Natural Gasoline Association of America, died in Dallas, Texas, on March 27. He was superintendent of gasoline plants for the Lone Star Gas Co. and Lone Star Producing Co.

Mr. Jarvis was a graduate of Texas A. and M. college and had been with the Lone Star organization since 1918.

The appointment of Harry Wheeldon as superintendent of gasoline plants has been announced by Julian L. Foster, general superintendent and chief engineer of both companies. Replacing Mr. Wheeldon as assistant superintendent of gasoline plants is Fred Townsend, superintendent of gasoline plants in the company's East Texas district.

◆ ◆

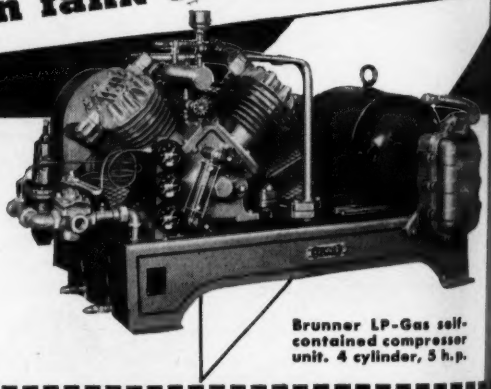
WPB Reorganization Makes Donald D. Davis Vice Chairman

The new set-up of the War Production Board under Chairman Donald Nelson is as fololws: Chas. E. Wilson, executive vice chairman; J. A. Krug, program vice chairman; Donald D. Davis, operations vice chairman; Ralph J. Cordiner, vice chairman, and Wm. L. Batt, vice chairman on international supply.

Mr. Davis' responsibilities include the direction and supervision of the Plumbing and Heating Division, under which the LP-Gas industry functions; the Automotive Division, and Construction and Utilities Bureau.

A PERMANENT CURE . . .

For LP-Gas losses in tank car unloading



Brunner LP-Gas self-contained compresser unit. 4 cylinder, 5 h.p.

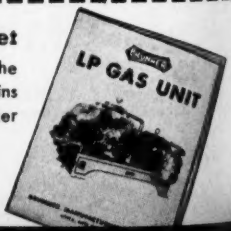
Americans on the home front have a big job to do. Besides getting out war supplies, they must help conserve vitally needed materials. Brunner LP-Gas units enable industrial users, bulk station plants and distributors to recover an additional 500 to 1000 lbs. of liquid petroleum gas per tank car unloaded. This saving in tank car vapors helps to build a huge reserve of this much needed LP-Gas. Let us tell you about the Brunner unit, today. Brunner Manufacturing Company, Utica, New York, U. S. A.

ARMY E NAVY

BRUNNER

Write for FREE Booklet

The new booklet describes the Brunner LP-Gas Unit, contains illustrations, diagrams and other pertinent facts on handling liquid petroleum gas.



WHO was the man who ran for vice-president with Willkie?

Chances are better than nine in ten you can't answer that one. You won't find many who can help you. Yet this man spoke plentifully on your radio . . . had his picture many times in newspapers, magazines and on posters. A little over two years ago! And today you've forgotten him.

How about the people in the *L-P Gas* industry that you did business with before the war . . . and hope to do business with again? Do you expect their memories to be better than yours?

Whether or not you have anything to sell now . . . *don't let them forget!* A regular schedule in Butane-Propane News will, at low cost, protect the prestige you so painstakingly built up . . . keep memory of your service fresh for the day when you can turn it to profit again.

1 BUTANE-PROPANE NEWS was the *first* book to serve this field . . . today stands *first* in paid subscribers . . . *first* in number of advertisers.

2 It has *two times* the paid circulation of the second publication in the field.

3 It has *three times* the number of advertisers in the second publication.

ABP ABC

Only book in the field with audited circulation.

BUTANE-PROPANE NEWS

Key Gas Men Needed at Home

The Draft and Occupational Deferment

THERE is concern throughout the LP-Gas industry over the loss to the armed services of men who are essential to the performance of expert service and the installation of equipment.

While the government officials have given assurance that they consider the natural gasoline, oil and natural gas industries to be vital to the war effort (see BUTANE-PROPANE *News*, March, 1943, Page 23), local draft boards have frequently drawn key men from those fields to fill their needed quotas.

Knowing the importance of the LP-Gas industry retaining its experienced personnel in the interest of the public and the war effort, as well, the Imperial Gas Co., Los Angeles, has prepared a letter to its numerous dealers in which the whole situation is reviewed and methods suggested to obtain deferments for men who cannot be replaced.

The letter, in large part, follows:

"The available supply of single, inductible men is almost exhausted. This means that married men and men with dependents between the ages of 18 and 38 may be subject to call. After May 1, 1943, those between 38 and 45 may be required either to find employment in an essential industry or join the army.

"Section 622.31-1 of Selective Service regulations states:* 'Class 3-B: Men deferred by reason of dependency and activity. In Class 3-B shall be placed any registrant who has one or more dependents as defined in Section 622.32 and who is engaged in a civilian activity which is necessary to war production or which is supporting the war effort."

"The advantage of Classification 3-B is that all physically qualified men in 3-A will be inducted into the armed forces before those in 3-B are reconsidered.

"The purpose of Classification 3-B is to give preferential treatment to essential industries so that their turn-over and labor shortage problems will be minimized to as great an extent as possible.

"Since the gas industry is a civilian activity which is necessary to war production and to the support of the war effort, all 3-A employees should be placed in 3-B, regardless of whether or not they are engaged in 'critical occupations.' Realizing that local draft boards do not have registrants filed in such a way as to make such reclassification immediately possible unless the cases are pointed out to them, DSS Form 42-A

*** This letter was sent out before the new order of the War Manpower Commission was released on April 12 which eliminated classification 3-B altogether and put men in essential occupations in Class 2-A. Dependency as a cause for deferment, as covered in the original 3-B, has also been eliminated for men with collateral dependents and wives only. In reading, substitute "2-A" for "3-B" with those facts in mind. The latest, complete list of Selective Service classifications appear on another page of this article.—Editor.**

REZNOR

Unit Heaters Help Keep Jim Off The Absentee List . . .

During Winter and Summer

GREATER EMPLOYMENT plus crowded plant conditions call for wider distribution of heat as well as better air circulation. Easily installed gas fired Reznor Unit Heaters meet these emergency demands. Due to the special design of Reznor Heat Exchanger Tubes, more warm air is moved from Reznor Heaters in winter and greater air circulation is provided during hot summer days. Men on the war production line work in comfort—hence, less fatigue, more efficiency, fewer days off for illness, and greater production result. This easy-to-install equipment SAVES 89% in vital materials. Write today.

REZNOR MANUFACTURING CO.

304 James St. Mercer, Penna.

"GAS HEATERS EXCLUSIVELY SINCE 1888"

TiteSeal holds Butane, Propane and ALL of the LP Gases

"After trying every other compound for leak-sealing Butane pipe joints I tried *TiteSeal*—and have used *TiteSeal* exclusively since, in our plant and installation work."

John MacIntosh, Engineer
Rulane Gas Co., Charlotte, N. C.

Brush-On TiteSeal

In the brush-equipped can, is a "natural" for gas plant maintenance, installation or service work. MacIntosh uses Brush-On **TiteSeal.**

Write For FREE SAMPLE

Prove to your own satisfaction that **TiteSeal** will end your leak troubles.

TiteSeal
DIVISION OF

Leak-Proof
Heat-Proof
Non-Hardening

RADIATOR SPECIALTY COMPANY

LOS ANGELES CHARLOTTE, N. C. TORONTO

has been made available so that employers in essential industries may petition for such reclassification.

"Form 42-A may be secured from local Selective Service headquarters.

"The Selective Service System, National Headquarters, Washington, D.C., has issued three directives to the Local Boards, which are intended to guide them in making a correct decision under Section 622.31-1 referred to above, and which apply to the LP-Gas industry:

" '1. Occupational Bulletin No. 9, as amended January 9, 1943, covers the following activities which are considered essential to the support of the war effort—electric light and power, water supply and gas utilities, and steam-heating companies.

" '2. Occupational Bulletin No. 15, issued Aug. 5, 1942, covering Petroleum, Natural Gas and Natural Gasoline activity.

" '3. Occupational Bulletin No. 42, issued Dec. 22, 1942, covering repair and hand-trade services.'

"The Selective Service System, Washington, D. C., under date of March 18, 1943, advises that the LP-Gas industry is included under Occupational Bulletin No. 9.

"The War Production Board has indicated (Priorities Regulation No. 10, issued June 1, 1942) that it considers the supply of gas and electricity second only to the mining of strategic metals among the essential industrial and civilian occupations. Our service is given preference even ahead of public and private health services, transportation and communication services.

"Even though the specific occupation referred to is included in Occupational Bulletins Nos. 9, 15 or 42 as a critical occupation, **this does not mean that all registrants engaged in this occupation are automatically deferred.** To quote the Director of the

HERE ARE THE NEW CLASSIFICATIONS

The revised classifications for Selective Service registrants are:

1-A	Available for military service.
1-A-O	Conscientious objector available for noncombatant military service.
1-C	Member of land or naval forces of the United States.
2-A	Man necessary in his essential civilian activity.
2-B	Man necessary to the war production program.
2-C	Man deferred by reason of his agricultural occupation or endeavor.
3-A	Man with child or children deferred by reason of maintaining bona fide family relationship.
3-C	Man with dependents who is regularly engaged in agricultural occupation or endeavor.
3-D	Man deferred because induction would cause extreme hardship and privation to a wife, child, or parent with whom he maintains a bona fide family relationship.
4-A	Man 45 years old, or over, who is deferred by reason of age.
4-B	Official deferred by law.
4-C	Neutral aliens requesting relief from liability for training and service, and aliens not acceptable to the armed forces.
4-D	Minister of religion or divinity student.
4-E	Conscientious objector available for work of national importance.
4-F	Physically, mentally, or morally unfit.
4-H	Men 38 to 45 now deferred because their age group is not being accepted for military service. (This group is being reclassified in case of eventual call.)

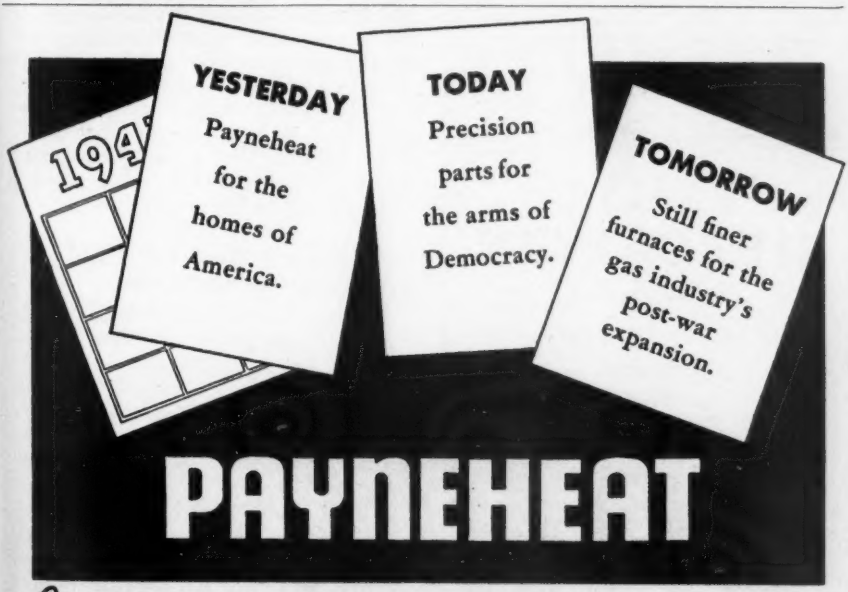
SAFE
DEPENDABLE
and
ECONOMICAL

SPECIAL STEEL FABRICATION

Quality pressure tanks of all sizes and for all purposes. Consult AMERICAN for your war-time needs. You will find our prices and deliveries most satisfactory.

AMERICAN PIPE & STEEL CORPORATION
Manufacturers and Distributors
Alhambra California

WELDED PRESSURE TANKS



Payne FURNACE & SUPPLY CO., INC., BEVERLY HILLS, CALIFORNIA

Selective Service System, 'Occupational bulletins merely request local boards to take into consideration the fact that the occupations listed therein are important to the war effort.'

"One suggestion which we would offer is that you go to the nearest United States Employment Office in the event one of your men is about to be drafted, and ask them to find you a qualified liquid gas man having the necessary degree of skill and training required to distribute and service our product. If your U. S. Employment Office is unable to secure such a man, you would, we believe, then be entitled to ask one of their members to go with you before the Draft Board so that they might be made aware of the extreme difficulty in finding a qualified and available replacement.

"One of the points which most interests the Local Board is the 'training, qualification, or skill of the registrant to engage in his occupation.' We believe that something along the following lines would cover this point:

" 'From two to three years are required to train a liquefied petroleum gas distributor and serviceman. His responsibilities require intimate and detailed knowledge of valves, gas pressures, regulator operation, thermostats, safety pilots and hundreds of different appliance burners.

" 'The LP-Gas distributor and serviceman must have the ability to repair tools, valves, burners, regulators, compressors, pumps and gas appliances such as refrigerators, stoves, water heaters and furnaces, as well as plumbing and pipe-fittings.

" 'He must have an intimate knowledge of the hundreds of different makes of stoves, water heaters, space heaters, furnaces, industrial torches, dental torches, lights, brooders, dairy sterilizers, etc. He must be able to make immediate adjustments to combustion controls in order to maintain safe and efficient operation.

" 'He must constantly inspect installations to see that they are properly installed in a safe operating condition and conform to all prevailing fire and safety regulations.' "

◆ ◆

New Forms Must Be Used For Priority Assistance

Business firms and individuals who normally apply for priority assistance on Form PD-1A are warned by War Production Board officials that, beginning April 15, only applications made on the revised version of that form, issued Jan. 16, will be considered.

PD-1A applications must be filed with the field office nearest the person seeking priority assistance. To send them directly to Washington entails delay in final action.

For Safety
and Economy

ETHYL MERCAPTAN

—Purified—

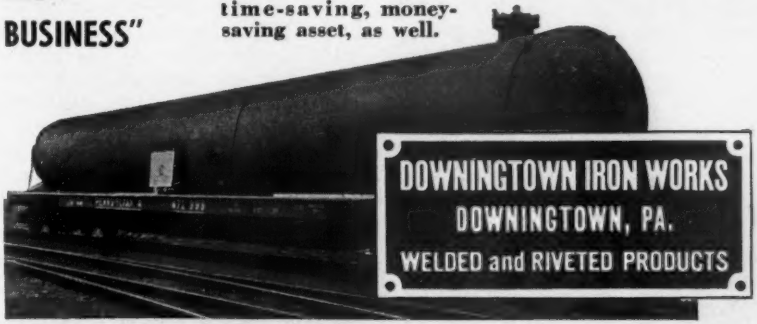
The ACCEPTED standard odorant for liquefied petroleum gases.

MALLINCKRODT CHEMICAL WORKS

ST. LOUIS NEW YORK

"GET A FABRICATOR WHO KNOWS HIS BUSINESS"

That's good advice for any buyer of propane storage tanks . . . for, *much of the safety and enduring quality of such tanks depends upon the fabricator's specifications for materials and choice of procedure for handling them!* Yes, wide experience and specialized knowledge, such as Downingtown can offer, is a first essential to good propane work . . . and it's a time-saving, money-saving asset, as well.



PROPANE TANKS FOR UNDERGROUND OR ABOVE-GROUND STORAGE

For Greater STABILITY

IN DEHYDRATED BUTANE AND PROPANE

. . . of Higher Quality Butane and Propane—for a Stable and More Uniform Product—assuring the utmost in satisfaction and efficient, trouble-free service—try Carter Better Products.

For complete information concerning Carter's dependable service write: The Carter Oil Company, Marketing Department, Room 928 National Bank of Tulsa Building, Tulsa, Okla.

DEHYDRATED
Propane and Butane

THE CARTER OIL COMPANY

TULSA, OKLAHOMA

Shipping Points: Seminole, Okla., Stonewall, Okla., St. Elmo, Ill.

WHOLESALE ONLY!

Will Talk Prices At P.C. Meeting

ONE of the most important meetings ever scheduled for the Pacific Coast Section, Liquefied Petroleum Gas Association, will be held in San Francisco on May 28, according to a special announcement of Chairman W. T. Joplin, of Phoenix, Ariz.

Of particular interest will be the report that Mr. Joplin will bring back from Washington, D. C., following the second meeting, May 3, of the Industry Advisory Committee of the War Production Board, of which he is a member. This committee, working so closely with the WPB, is expected to perform inestimable good for the members of the LP-Gas industry. It is composed of 11 members, representing large and small dealers, distributors and producers from Coast to Coast.

Also of utmost concern to Pacific Coast men will be a discussion of current OPA regulations. A survey is now being made to determine how seriously Coast dealers are affected by price freezing in the industry and ways to relieve inequities, where they are found, will be considered and presented to the OPA.

It is expected that government representatives of the WPB, the ODT and the Selective Service Branch will make addresses.

Dave Purrington, of the Standard Oil Co. of California, has been made chairman of arrangements for the San Francisco meeting, which will be held in the St. Francis hotel. Mr. Purrington is also a member of the Industry Advisory Committee. He urges that all who expect to attend make reservations early with the hotel, and that members come prepared to offer constructive ideas for the improvement of the Pacific Coast Section and the industry as a whole.

◆ ◆

Plant Protection Is Urged In Recent OCD Booklet

A "plant protection fact sheet" containing the highlights of a booklet entitled "Passive Protection for Industrial Plants" has been issued by the U. S. Office of Civilian Defense.

▲

W. T. Joplin, chairman of Pacific Coast Section, LPGA, and member of Industry Advisory Committee of the War Production Board.

▼

We are not forgetting

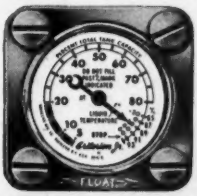
Though we have converted all our facilities to war production, we are not forgetting our customers in the LP-Gas industry.

When the war is won we shall do everything to maintain our reputation as manufacturers of first quality LP-Gas equipment.

McNAMAR

BOILER & TANK COMPANY

Tulsa, Okla. Salem, Ill.



LONG WILL THEY SERVE!

. . . that's because Rochester Gauges are carefully designed and durably built to serve with greater accuracy and dependability throughout the present emergency.

ROCHESTER MFG. CO., INC.
17 Rockwood St., Rochester, N. Y.

ROCHESTER
Criterion GAUGES

SINCLAIR LP-GASES...

VITAL for VICTORY

Uncle Sam's mechanized fighting forces must be self-maintained like a great American circus. Planes, tanks, trucks, jeeps and guns not only travel under their own power—they must be repaired in the field. Mobile maintenance units and repair shops are a part of every armed force in action.

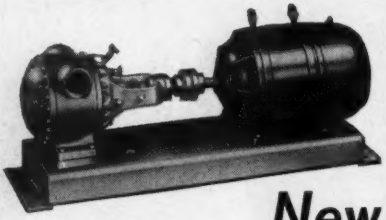
And the lessons learned in American industries at home are proving profitable on the field of battle. For welding and repair work, Sinclair LP-Gases are supplying adequate, dependable heat and power.

As with all other vital materials, America at war has first call on our LP-Gas production, but our expanding facilities have been sufficient to take care of every normal requirement.

Protect your fuel requirements by contracting with

SINCLAIR PRAIRIE OIL COMPANY

Liquefied Petroleum Gas Division
Sinclair Bldg. Tulsa, Okla.



New
Model 210
SMITH PUMPS

meet every requirement. The balanced gear construction of SMITH Butane-Propane PUMPS reduces internal wear. Fluid sealed packing box makes hazardous gas leaks impossible.

Order Model 211 for truck mounting.

Immediate Delivery

SMITH *Precision Products* COMPANY
1135 MISSION ST. · SOUTH PASADENA, CALIF.

WAR HOUSING

LPG HEATERS

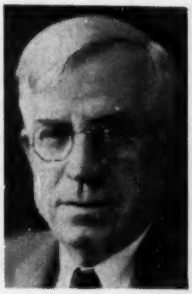
LPG Dealers find real profit in BRILLIANT FIRE sales because the product is time-tested, trustworthy. Geared for economy operation and negligible servicing. These popular heat-makers are offered in a variety of styles for every home need.

Write for Catalog

Brilliant Fire GAS HEATERS
THE OHIO FOUNDRY & MANUFACTURING CO.
QUALITY HEATING EQUIPMENT SINCE 1846
STEUBENVILLE, OHIO

Midwest Section Meets May 14-15

A MEETING of the Midwest Section, LPGA, has been called for May 13-14 at the Palmer House in Chicago, according to an announcement of the national association.



L. R. FORSYTH

The tentative program arranged includes for the first day an address by L. R. Forsyth, chairman of the Midwest Section, and a forum meeting directed by E. L. Mills which will probably include talks by government officials on selective service, WPB orders affecting the industry, and ODT regulations. Dinner that evening will be at Colosimos'.

On Friday, May 14, the luncheon and business meeting will be combined, followed by the election of new officers, a motion picture of petroleum production, a report from the National Advisory Committee of the War Production Board, and papers by members outlining ways and means of aiding industry members.

A "customer service symposium," with E. Carl Sorby as moderator, will cover the subjects of "Maintenance of Gas Equipment," by C. C. Turner; "Appliance Service," by D. W. Bennett, and "Cylinder Turnover," as yet unassigned.

Hotel reservations should be made with the Palmer House, identifying yourself with the LPGA. The registration fees are $10 for members and $20 for non-members, covering two luncheons, banquet and entertainment.

Order These Famous L. P. Gas Products From Us . . . .

RESO LAP GAS

The BASTIAN-BLESSING

THE DAYTON-DOWD CO.

Hackney
BUTANE-PROPANE CYLINDERS

L.C. RONEY INC.

The IMPERIAL BRASS MFG. CO.

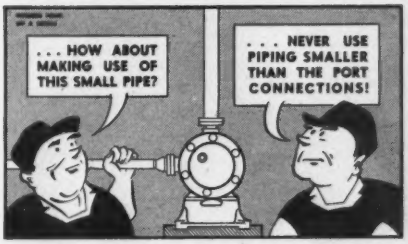
GAS EQUIPMENT CO., INC.
2620 South Ervay Street, Dallas, Texas

GAS EQUIPMENT SUPPLY CO.

L.C. RONEY, INC.

meets the demands of the nation. Our plant has gone to war for the duration — but when peace comes, L. C. RONEY products for the LP-Gas industry will meet the demands of dealers everywhere. In the meantime—our stock of LP-Gas equipment is still complete.

L.C. RONEY INC.
1740-44 W. 59th ST. • LOS ANGELES, CALIF.



How To Get the Most Work Out Of Your

VIKING PUMPS

Use of pipe of the proper size for suction and discharge lines is essential to the efficient operation of Viking Rotary Pumps. Do not use pipes smaller than the connections on the pump. The next larger size is preferable, especially on heavier oils or on suction lines exceeding 100 feet. If suction lines required are longer than 200 feet, write for special recommendations.

Now that pumps are hard to get it pays to take good care of the ones you have. The Viking Service Manual tells you how. It gives you clear, practical help in mounting, operating and maintaining Viking Rotary Pumps. Write today for your copy of the Viking Service Manual. It's free and will be sent by return mail.

★

VIKING PUMP COMPANY
CEDAR FALLS, IOWA

Louisiana Group Elects Officers

The Louisiana Butane Dealers Association, meeting in Baton Rouge, La., Feb. 26, elected as its president C. W. Guy, of the General Gas Corp., of Baton Rouge. Other officers named are A. R. Blossman, Covington, vice president; J. R. Holicer, Shreveport, secretary, and Quintin Jones, Houma, treasurer.

The new board of directors consists of the above named officers and Louis Abramson, Jr., New Orleans, president of the national LPGA; J. J. Oden and R. D. Phillips, Baton Rouge; C. E. Lawrence, Leesville, and E. C. Readheimer, Campti.

◆ ◆

F. M. Taylor Becomes LPGA Sectional Secretary

Frank M. Taylor, assistant manager of Petrolane, Ltd., Long Beach, Calif., is the new secretary of the Pacific Coast Section, LPGA. He was appointed in March by Sectional Chairman W. T. Joplin to fill the position of John H. Kunkel, resigned, who served the association for three years as executive secretary and who is now director of public relations and advertising for the Fluor Corp., Los Angeles. Mr. Taylor has long been identified with the LP-Gas industry.

F. M. TAYLOR

The former office of the secretary, in the Van Nuys building in Los Angeles has been closed and all communications should be addressed to either Mr. Joplin, Butane Corp., Phoenix, Ariz., or to Mr. Taylor at Drawer 851, Long Beach.

◆ ◆

Geo. D. Roper Corp. Wins Army-Navy "E" Award

Employees of the Geo. D. Roper Corp. have been designated by the War and Navy Departments to receive the Army-Navy production award popularly known as the Army-Navy "E." Based primarily on quantity and quality of war production, the award entitles the Geo. D. Roper Corp. to fly the "E" flag.

Army and Navy officials will make the presentation of the "E" burgee and the employee "E" pins at a ceremony to be held in the near future.

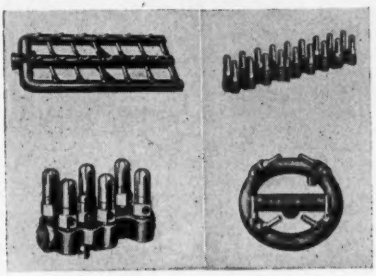
The Geo. D. Roper Corp. was one of the first to convert equipment and personnel from peace time activities to the manufacture of implements of war. Direct contract work is being done on an extensive basis for both the Army and Navy and many subcontract jobs are being handled for other prime contractors.

◆ ◆

K. S. Gray, Range Salesmanager, Dies in San Diego, Calif.

K. S. Gray, Northwestern Division salesmanager for Detroit-Michigan Stove Co., died April 15. The death occurred in San Diego, Calif., where Mr. Gray was visiting his son, a marine corps aviator. He was 54 years old, and was born in Philadelphia.

Much of Mr. Gray's life was spent in the west. He had been with Detroit-Michigan Stove Co. for the past nine years, starting as a representative in Kansas and Missouri, and was given charge of sales of several states in the Northwest in 1940.



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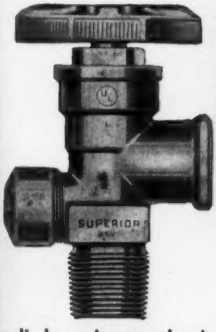

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SUPERIOR VALVE & FITTINGS CO
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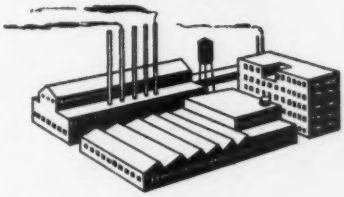
The Flame of the Forge



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C. O. Lauritzen, Nevada Dealer, Passed Away in March

C. O. Lauritzen, proprietor of the Clark County (Nevada) Gas Co., died the middle of March in Las Vegas.

Mr. Lauritzen had been a "Rockgas" dealer in Nevada for 15 years and had developed a large business. Mrs. Lauritzen will continue with the company operations with Byron Thornton as manager.

◆ ◆

Nebraska Kills LP-Gas Bill

Legislative Bill 404, pertaining to the storing and distribution of liquefied petroleum gas in the state of Nebraska has been indefinitely postponed, according to Frank Marsh, secretary of state.

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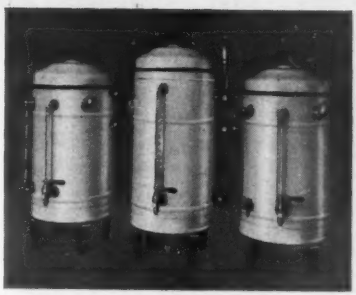

● YOUR CUSTOMERS in need of new coffee urns will welcome this good news. "VICTORY" COFFEE URNS, utilizing the less critical materials, and designed for use with butane-propane, are now available on suitable priorities. These attractive urns will give splendid service and, with reasonable care, will last for years. Fabricated from high-quality enameling iron, completely porcelain-enameled, inside and out. Surfaces are smooth, sanitary and easy to clean. Inside corners of urn bodies and liners are rounded. Jar-ring and liner are welded into one continuous, crevice-free unit, finished all over in gleaming porcelain enamel. Single urns, combinette-type urns and batteries are available in various sizes and types to suit specific requirements.

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